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FAA Approved AIRPLANE FLIGHT MANUAL SUPPLEMENT

G1000 Integrated Avionics System and GFC 700 AFCS In Hawker Beechcraft C90A, C90GT and C90GTi King Air Aircraft

Dwg. Number: 190-00682-02 Rev. F

This Supplement is Applicable to the Following Manuals:

90-590024-5	90-590024-43
90-590024-23	90-590024-35
90-590024-61	90-590024-69
90-590024-111	90-590024-163
90-590024-217	

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the Garmin G1000 Integrated Avionics System is installed in accordance with STC SA01456WI-D. The information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures, and Performance information not contained in this Supplement consult the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

Airplane Serial Number: _____

Airplane Registration Number: _____

FAA Approved By: _____

Robert G. Murray
ODA STC Unit Administrator
Garmin International, Inc
ODA-240087-CE

Date: 4/14/2014

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Log of Revisions

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement for

G1000 Integrated Avionics System and GFC 700 AFCS In Hawker Beechcraft C90A, C90GT and C90GTi King Air Aircraft

REV NO.	PAGE NO(S)	DESCRIPTION	DATE OF APPROVAL	FAA APPROVED
A	ALL	Original Issue	11/08/2007	Robert G. Murray, DAS Administrator Garmin International, Inc. DAS-240087-CE
B	ALL	Repaginated	11/21/2007	Robert G. Murray, DAS Administrator Garmin International, Inc. DAS-240087-CE
C	17, 24	Added Non-essential equipment list to DUAL GENERATOR FAILURE procedure, added GDU cooling fans to minimum equipment list, editorial updates.	03/13/2008	Robert G. Murray Lead ODA Administrator Garmin International, Inc ODA-240087-CE
D	All	Updated System Software Version from 0636.01 to 0636.02	05/18/2010	Robert G. Murray Lead ODA Administrator Garmin International, Inc ODA-240087-CE
E	All	Updated System Software Version from 0636.02 to 0636.03	11/2/2012	Robert G. Murray Lead ODA Administrator Garmin International, Inc ODA-240087-CE
F	All	Updated System Software Version from 0636.03 to 0636.05, editorial update.	See Cover	See Cover

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Table of Contents

Section 1 – General 7

Section 2 – Limitations 16

Section 3 - Emergency Procedures 29

Section 3A - Abnormal Procedures 39

Section 4 - Normal Procedures 61

Section 5 – Performance 85

Section 6 - Weight and Balance 85

Section 7 - Systems Description 87

Section 8 – Handling, Service, and Maintenance 124

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Section 1 - General

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (POH/AFM) when the airplane has been modified by installation of the GARMIN G1000 Integrated Avionics System and GFC 700 Digital Automatic Flight Guidance System in accordance with GARMIN International, Inc. approved data.

The information in this supplement supersedes or adds to the basic POH/AFM only as set forth below. Users of the manual are advised to always refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

The GARMIN G1000 system installed in the Hawker Beechcraft C90A, C90GT and C90GTi King Air Aircraft provides a fully integrated Display, Communications, Navigation and Flight Control system. Functions provided by the G1000 system include: Primary Flight Information, Powerplant Monitoring, Navigation, Communication, Traffic Surveillance, TAWS Class B, Weather Avoidance, and a three-axis automatic flight control / flight director system with optional Electronic Stability & Protection.

USE OF THE HANDBOOK

The following definitions apply to WARNINGS, CAUTIONS and NOTES found throughout the handbook:

WARNING

Operating procedures, techniques, etc., which could result in personal injury or loss of life if not carefully followed.

CAUTION

Operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.

NOTE

Operating procedures, techniques, etc., which is considered essential to emphasize.

G1000 GNSS (GPS/SBAS) NAVIGATION SYSTEM EQUIPMENT APPROVALS

The Garmin G1000 Integrated Avionics GNSS navigation system installed in this aircraft is a GPS system with a Satellite Based Augmentation System (SBAS) comprised of two TSO-C145a Class 3 approved Garmin GIA 63Ws, TSO-C146a Class 3 approved Garmin GDU 104X Display Units, GARMIN GA36 and GA37 antennas, and GPS software version 3.2 or later approved version. The G1000 GNSS navigation system in this aircraft is installed in accordance with AC 20-138A.

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft complies with the requirements of AC 20-138A and is approved for navigation using GPS and SBAS (within the coverage of a Satellite Based Augmentation System complying with ICAO Annex 10) for IFR en route, terminal area, and non-precision approach operations (including those approaches titled “GPS”, “or GPS”, and “RNAV (GPS)” approaches). The G1000 Integrated Avionics GNSS navigation system installed in this aircraft is approved for approach procedures with vertical guidance including “LPV” and “LNAV/VNAV”, within the U.S. National Airspace System.

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft complies with the equipment requirements of AC 90-105 and meets the equipment performance and functional requirements to conduct RNP terminal departure and arrival procedures and RNP approach procedures without RF (radius to fix) legs. Part 91 subpart K, 121, 125, 129, and 135 operators require a Letter of Authorization for operational approval from the FAA

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft complies with the equipment requirements of AC 90-100A for RNAV 2 and RNAV 1 operations. In accordance with AC 90-100A, Part 91 operators (except subpart K) following the aircraft and training guidance in AC 90-100A are authorized to fly RNAV 2 and RNAV 1 procedures. Part 91 subpart K, 121, 125, 129, and 135 operators require a Letter of Authorization for operational approval from the FAA.

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft has been found to comply with the requirements for primary means of Class II navigation in oceanic and remote navigation (RNP-10) without time limitations in accordance with AC 20-138A and FAA Order 8400.12A. The G1000 can be used without reliance on other long-range navigation systems. This does not constitute an operational approval.

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft has been found to comply with the navigation requirements for primary means of Class II navigation in oceanic and remote navigation (RNP-4) in accordance with AC 20-138A and FAA Order 8400.33. The G1000 can be used without reliance on other long-range navigation systems. Additional equipment may be required to obtain operational approval to utilize RNP-4 performance. This does not constitute an operational approval.

The Garmin G1000 Integrated Avionics GNSS navigation system as installed in this aircraft complies with the accuracy, integrity, and continuity of function, and contains the minimum system functions required for PRNAV operations in accordance with JAA Administrative & Guidance Material Section One: General Part 3: Temporary Guidance Leaflets, Leaflet No 10 (JAA TGL-10 Rev 1). The GNSS navigation system has two ETSO-145 / TSO-C145a Class 3 approved Garmin GIA 63Ws, and ETSO-146 / TSO-C146a Class 3 approved Garmin GDU 104X Display Units. The G1000 Integrated Avionics GNSS navigation system as installed in this aircraft complies with the equipment requirements for PRNAV and BRNAV operations in accordance with AC 90-96A and JAA TGL-10 Rev 1. This does not constitute an operational approval.

Garmin International holds an FAA Type 2 Letter of Acceptance (LOA) in accordance with AC 20-153 for database Integrity, quality, and database management practices for the Navigation database. Pilots and operators can view the LOA status at www.Garmin.com > Aviation Databases > Type 2 LOA Status.

Navigation information is referenced to WGS-84 reference system.

ELECTRONIC FLIGHT BAG

The G1000 Integrated Avionics System as installed in this aircraft supports approval of AC 120-76B Hardware Class 3, Software Type B Electronic Flight Bag (EFB) electronic aeronautical chart applications when using current FliteChart or ChartView data. Additional operational approvals may be required.

For operations under 14 CFR Part 91, it is suggested that a secondary or back up source of aeronautical information necessary for the flight be available to the pilot in the aircraft. The secondary or backup information may be either traditional paper-based material or displayed electronically. If the source of aeronautical information is in electronic format, operators must determine non-interference with the G1000 system and existing aircraft systems for all flight phases.

ABBREVIATIONS AND TERMINOLOGY

The following glossary is applicable within the airplane flight manual supplement

AC	Advisory Circular
ADC	Air Data Computer
ADF	Automatic Direction Finder
AFCS	Automatic Flight Control System
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AGL	Above Ground Level
Ah	Amp hour
AHRS	Attitude and Heading Reference System
ALT	Altitude, or AFCS altitude hold mode, or ALT button on the GMC 710 AFCS Mode Controller
ALTS	AFCS altitude capture using the altitude in the altitude preselect window
ALTV	AFCS altitude capture using the altitude from the VNAV profile vertical constraint
AMMD	Airport Moving Map Display
AP	Autopilot
APR	AFCS Approach mode, or APR button of GMC 710 AFCS mode controller
APTSIGNS	Airport Signs (SVS softkey on the PFD)
APV	Approach with Vertical Guidance
AS	Airspeed
ATC	Air Traffic Control
AUX	Auxiliary
BANK	Low-bank mode of the AFCS
BARO	Barometric Setting
BAT	Battery
BC	Back Course
BRNAV	Basic Area Navigation
BRT	Bright
C	Celsius
CDI	Course Deviation Indicator
CLR	Clear
COM	Communication radio
CRG	Cockpit Reference Guide
CRS	Course
CWS	Control Wheel Steering

DA	Decision Altitude
DC	Direct Current
DH	Decision Height
DL LTNG	GFDS Data Link Lightning
DME	Distance Measuring Equipment
DN	Down
DR	Dead Reckoning
EC	Error Correction
EFB	Electronic Flight Bag
EIS	Engine Indication System
ELEC	Electrical
ENT	Enter
ESP	Electronic Stability and Protection
FAF	Final Approach Fix
FD	Flight Director
FLC	AFCS Flight Level Change mode, or FLC button on the GMC 710 AFCS mode controller
FLTA	Forward Looking Terrain Awareness
FMS	Flight Management System
FPM	Flight Path Marker or Feet Per Minute
FSB	Fasten Seat Belts
ft	Feet
ft-lbs	Foot-Pounds
ft/min	Feet/Minute
GA	Go-around
GCU	Garmin Control Unit
GDC	Garmin Air Data Computer
GDL	Garmin Data Link Radio
GDU	Garmin Display Unit
GEA	Garmin Engine/Airframe Unit
GEN	Generator
GEO	Geographic
GFC	Garmin Flight Control
GFDS	Garmin Flight Data Services
GIA	Garmin Integrated Avionics Unit
GMA	Garmin Audio Panel System
GMC	Garmin Mode Control Unit

GP	GPS Glide Path
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
GRS	Garmin Reference System (AHRS)
GS	Glide Slope
GSA	Garmin Servo Actuator
GSR	Garmin Iridium Satellite Radio
HDG	AFCS heading mode or the HDG button on the GMC 710 AFCS Mode Controller
HITS	Highway in the Sky
HPa	Hectopascal
HSI	Horizontal Situation Indicator
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
IAS	Indicated Airspeed
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
in-Hg	inches of mercury
INH	Inhibit
ITT	Interstage Turbine Temperature
KIAS	Knots Indicated Air Speed
Kt(s)	Knot(s)
LCD	Liquid Crystal Display
LDA	Localizer Type Directional Aid
LNAV	Lateral Navigation
LNAV + V	Lateral Navigation with Advisory Vertical Guidance
LNAV/VNAV	Lateral Navigation / Vertical Navigation
LOA	Letter of Acceptance
LOC	Localizer
LOI	Loss of Integrity (GPS)
LPV	Localizer Performance with Vertical Guidance
LRN	Long Range Navigation
LRU	Line Replaceable Unit
LTNG	Lightning (XM Weather Product)
M	Mach

MAP	Missed Approach Point
MAXSPD	Maximum Speed, AFCS Overspeed Protection mode
Mb	Millibars
MDA	barometric minimum descent altitude
MEL	Minimum Equipment List
MFD	Multi Function Display
MLS	Microwave Landing System
M_{MO}	Maximum operation limit speed in mach
MNPS	Minimum Navigational Performance Specifications
MSL	Mean Sea Level
NAT	North Atlantic Track
NAV	Navigation, or AFCS navigation mode, or NAV button on the GMC710 AFCS Mode Controller
NEXRAD	Next Generation Radar (XM Weather Product)
NM	Nautical Mile
NPA	Non-precision Approaches
OAT	Outside Air Temperature
OBS	Omni Bearing Selector
ODP	Obstacle Departure Procedure
OVR	Override
P/N	Part Number
PDA	Premature Descent Alert
PFD	Primary Flight Display
PFT	Pre-Flight Test
PIT	AFCS pitch mode
POH	Pilot's Operating Handbook
PRNAV	Precision Area Navigation
PROC	Procedure button on the GDU or GCU 477
PSI	Pounds per Square Inch
PTCH	Pitch
PWR	Power
RA	Radar Altimeter, or Radar Altitude
RNAV	Area Navigation
RNP	Required Navigation Performance
ROL	AFCS roll mode
RPM	Revolutions per Minute
RVSM	Reduced Vertical Separation Minimums

SBAS	Satellite Based Augmentation System
SDF	Simplified Directional Facility
SID	Standard Instrument Departure
SPD	Speed button on the GMC 710 AFCS Mode Controller. Toggles the FLC speed between Mach and IAS references.
STAR	Standard Terminal Arrival Route
STBY	Standby
STC	Supplemental Type Certificate
STD	Standard
SUSP	Suspend
SVS	Synthetic Vision System
SW	Software
SYN TERR	Synthetic Terrain softkey
SYN VIS	Synthetic Vision softkey
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TEMP	Temperature
TIS	Traffic Information System
TMR	Timer
TO	Take off
TOD	Top of Descent
TSO	Technical Standard Order
USP	Autopilot Underspeed Protection
VAPP	AFCS VOR Approach Mode
VCO	Voice Call Out
Vdc	Volts DC
VDP	Visual Descent Point
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VMI	Vibro-meter Inc.
V_{MO}	Maximum operation limit speed in knots
VNAV	Vertical Navigation
VNV	Vertical Navigation button on the GMC 710 AFCS Mode Controller
VOR	VHF Omni-directional Range
VPTH	Vertical path
VS	Vertical Speed

WAAS	Wide Area Augmentation System
WFDE	WAAS Fault Detection/Exclusion
WGS-84	World Geodetic System – 1984
WSHLD	Windshield
XFR	Transfer button on the GMC 710 AFCS Mode Controller
XM	XM satellite system
XPDR	Transponder
YD	Yaw Damper

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Section 2 - Limitations

INTRODUCTION

The G1000 Cockpit Reference Guide for Hawker Beechcraft C90A/GT (CRG) must be immediately available to the flight crew. Use the G1000 Cockpit Reference Guide for Hawker Beechcraft C90A/GT, Garmin part number 190-00664-02, revision A or later approved revision when System Software Version 0636.05 is installed. The System Software Version number is displayed at the top right side of the MFD Power-up page.

AIRSPEED LIMITATIONS AND INDICATOR MARKINGS

No change to the airplane's airspeed limitations. The airspeed indicators on the Primary Flight Displays (PFDs) and the standby airspeed indicator are marked in accordance with the airplane's POH/AFM, or applicable Airplane Flight Manual Supplement.

A low speed awareness band is marked on the PFDs in red from 20 – 78 KIAS. While the airplane is on the ground, the low speed awareness band is suppressed. It displays in flight two seconds after main gear liftoff.

The standby airspeed indicator is marked in accordance with the airspeed markings called out in the airplane's AFM/POH. The standby airspeed indicator is not marked with a low speed awareness band.

POWER PLANT LIMITATIONS AND INDICATOR MARKINGS

No change to the airplane's powerplant operating limitations. The engine gauges are marked in accordance with the airplane's POH/AFM or, if an engine modification has been installed, in accordance with the AFMS for the engine modification.

NOTE

The gauge indicator pointer and digital display will flash inverse red/white video for 5 seconds and then remain steady red if the indicated engine parameter exceeds its established limit.

G1000 INTEGRATED AVIONICS SYSTEM

The Garmin G1000 Cockpit Reference Guide P/N 190-00664-02, Rev A, or later FAA approved revision, must be immediately available to the flight crew.

Required flight crewmembers must wear and use headsets when the overhead cockpit speaker audio is selected OFF.

Do not take off unless all display units are installed and operational.

Do not take off with any display in reversionary mode.

Do not take off with any of the following messages displayed in the ALERTS window:

GPS1 FAIL and GPS2 FAIL simultaneously	PFD1 SERVICE
GPS NAV LOST	PFD2 SERVICE
GIA1 SERVICE	GMA1 SERVICE
GIA2 SERVICE	GMA2 SERVICE
MFD SERVICE	GEO LIMITS

Do not takeoff if PFD1 FAN FAIL, PFD2 FAN FAIL, MFD FAN FAIL, GIA1 FAN FAIL or GIA2 FAN FAIL is displayed in the ALERTS window **AND** the Outside Air Temperature is greater than 20°C (68°F).

Ground operation of the G1000 system is limited to 18 minutes when the Outside Air Temperature is greater than 47°C (116°F) **AND** air conditioning is inoperative.

The G1000 system must be turned on and operated for at least 30 minutes before takeoff if ground outside air temperature is -40°C (-40°F) or below.

Use of VNAV is prohibited during the intermediate segment of an approach that includes a teardrop course reversal. VNAV will become 'Unavailable' at the beginning of the teardrop segment of the course reversal.

Use of VNAV is prohibited with course changes greater than 90°.

The fuel quantity, fuel required, fuel remaining, and gross weight estimate functions of the G1000 are supplemental information only and must be verified by the flight crew.

Do not use SafeTaxi or Chartview functions as the basis for ground maneuvering. SafeTaxi and Chartview functions do not comply with the requirements of AC 20-159 and are not qualified to be used as an airport moving map display (AMMD). SafeTaxi and Chartview are to be used by the flight crew to orient themselves on the airport surface to improve pilot situational awareness during ground operations.

The use of the colors red and amber within the checklist function has not been evaluated or approved by this STC. Use of the colors red and/or amber within user created checklists may require separate evaluation and approval by the FAA.

G1000 GNSS (GPS/SBAS) NAVIGATION SYSTEM LIMITATIONS

NOTE

Limitations are in bolded text for this section only

The pilot must confirm at system initialization that the Navigation database is current.

Navigation database is expected to be current for the duration of the flight. **If the AIRAC cycle will change during flight, the pilot must ensure the accuracy of navigation data, including suitability of navigation facilities used to define the routes and procedures for flight. If an amended chart affecting navigation data is published for the procedure, the database must not be used to conduct the procedure.**

GPS/SBAS based IFR enroute, oceanic, and terminal navigation is prohibited unless the pilot verifies and uses a valid, compatible, and current Navigation database or verifies each waypoint for accuracy by reference to current approved data.

Discrepancies that invalidate a procedure should be reported to Garmin International. **The affected procedure is prohibited from being flown using data from the Navigation database until a new Navigation database is installed in the aircraft and verified that the discrepancy has been corrected.** Contact information to report Navigation database discrepancies can be found at www.Garmin.com>Support>Contact Garmin Support>Aviation. Pilots and operators can view navigation data base alerts at www.Garmin.com > In the Air> NavData Alerts.

For flight planning purposes, in areas where SBAS coverage is not available, the pilot must check RAIM availability. Within the United States, RAIM availability can be determined using the G1000 WFDE Prediction program, part number 006-A0154-01 (010-G1000-00) or later approved version with Comant CI 428-410 and CI 428-200 antennas selected, or the FAA's en route and terminal RAIM prediction website: www.raimprediction.net, or by contacting a Flight Service Station. Within Europe, RAIM availability can be determined using the G1000 WFDE Prediction program or Europe's AUGER GPS RAIM Prediction Tool at http://augur.ecacnav.com/augur/app/home. For other areas, use the G1000 WFDE Prediction program. This requirement is not necessary if SBAS coverage is confirmed to be available along the entire route of flight. The route planning and WFDE prediction program may be downloaded from the GARMIN G1000 website on the internet. For information on using the WFDE Prediction Program, refer to GARMIN WAAS FDE Prediction Program, part number 190-00643-01, 'WFDE Prediction Program Instructions'.

For flight planning purposes, operations within the U.S. National Airspace System on RNP and RNAV procedures when SBAS signals are not available, the availability of GPS integrity RAIM shall be confirmed for the intended route of flight. In the event of a predicted continuous loss of RAIM of more than five minutes for any part of the intended route of flight, the flight should be delayed, canceled, or re-routed on a track where RAIM requirements can be met.

For flight planning purposes for operations within European B-RNAV and P-RNAV airspace, if more than one satellite is scheduled to be out of service, then the availability of GPS integrity RAIM shall be confirmed for the intended flight (route and time). In the event of a predicted continuous loss of RAIM of more than five minutes for any part of the intended flight, the flight should be delayed, canceled, or re-routed on a track where RAIM requirements can be met.

For flight planning purposes, operations where the route requires Class II navigation the aircraft's operator or flight crew must use the Garmin WFDE Prediction program to demonstrate that there are no outages on the specified route that would prevent the G1000 from providing primary means of Class II navigation in oceanic and remote areas of operation that requires (RNP-10 or RNP-4) capability. If the Garmin WFDE Prediction program indicates fault exclusion (FDE) is unavailable for

more than 34 minutes in accordance with FAA Order 8400.12B for RNP-10 requirements, or 25 minutes in accordance with FAA Order 8400.33 for RNP-4 requirements, then the operation must be rescheduled when FDE is available.

Both GIA 63Ws GPS navigation receivers must be operating and providing GPS navigation guidance to their respective PFD for operations requiring RNP-4 performance.

North Atlantic (NAT) Minimum Navigational Performance Specifications (MNPS) Airspace operations per AC 91-49 and AC 120-33 require both GPS/SBAS receivers to be operating and receiving usable signals except for routes requiring only one Long Range Navigation sensor. Each display computes an independent navigation solution based on the on-side GPS sensor. However, either display will automatically revert to the cross-side sensor if the on-side sensor fails or if the cross-side sensor is determined to be more accurate. A "BOTH ON GPS1" or "BOTH ON GPS2" message does not necessarily mean that one GPS has failed. Refer to the MFD AUX-GPS STATUS page to determine the state of the unused GPS.

Whenever possible, RNP and RNAV routes including Standard Instrument Departures (SIDs) and Obstacle Departure Procedures (ODPs), Standard Terminal Arrival (STAR), and enroute RNAV "Q" and RNAV "T" routes should be loaded into the flight plan from the database in their entirety, rather than loading route waypoints from the database into the flight plan individually. Selecting and inserting individual named fixes from the database is permitted, provided all fixes along the published route to be flown are inserted. **Manual entry of waypoints using latitude/longitude or place/bearing is prohibited.**

"GPS", "or GPS", and "RNAV (GPS)" instrument approaches using the G1000 System are prohibited unless the pilot verifies and uses the current Navigation database. GPS based instrument approaches must be flown in accordance with an approved instrument approach procedure that is loaded from the Navigation database.

Not all published Instrument Approach Procedures (IAP) are in the Navigation database. **Pilots planning on flying an RNAV instrument approach must ensure that the Navigation database contains the planned RNAV Instrument Approach Procedure and that approach procedure must be loaded from the Navigation database into the FMS flight plan by its name.**

IFR non-precision approach approval using the GPS/SBAS sensor is limited to published approaches within the U.S. National Airspace System. Approaches to airports in other airspace are not approved unless authorized by the appropriate governing authority.

When operating under instrument flight rules, flight plan selection of any required alternate airport must not be based on an RNAV (GPS) LP/LPV or LNAV/VNAV approach. Alternate airport selection must be based upon an LNAV approach or an available ground-based approach for which the aircraft is equipped to fly.

The navigation equipment required to join and fly an instrument approach procedure is indicated by the title of the procedure and notes on the IAP chart. **Use of the GARMIN G1000 GPS/SBAS receivers to provide navigation guidance during the final approach segment of an ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for "or GPS" navigation is prohibited. When using the G1000 VOR/LOC/GS receivers to fly the final approach segment, VOR/LOC/GS navigation data is must be selected and presented on the CDI of the pilot flying.**

Navigation information is referenced to WGS-84 reference system, and should only be used where the Aeronautical Information Publication (including electronic data and aeronautical charts) conform to WGS-84 or equivalent.

AHRS AREAS OF OPERATION

Flight operations with the G1000 Integrated Avionics installed are prohibited in the following regions due to unsuitability of the magnetic fields near the Earth's poles:

1. North of 72° North latitude at all longitudes
2. South of 70° South latitude at all longitudes
3. North of 65° North latitude between longitude 75° W and 120° W (Northern Canada)
4. North of 70° North latitude between longitude 70° W and 128° W (Northern Canada)
5. North of 70° North latitude between longitude 85° E and 114° E (Northern Russia)
6. South of 55° South latitude between longitude 120° E and 165° E (Region south of Australia and New Zealand)

NOTE

The Garmin G1000 system is not designed for use as a polar navigator and operation outside the approved operating area is prohibited. The GRS-77 AHRS internally monitors the magnetic field and will display a GEO LIMITS system message when the magnetic field becomes unsuitable for AHRS operation. When the AHRS can no longer reliably compute heading, heading information will be removed from the HSI.

AUTOPILOT OPERATION LIMITS

One pilot must remain seated at the controls, with seatbelt fastened, during all autopilot operations.

Do not use autopilot or yaw damper during takeoff and landing.

The GFC 700 AFCS preflight test must be successfully completed prior to use of the autopilot, flight director or manual electric trim. Use of the autopilot or manual electric trim system is prohibited if the preflight test is not satisfactorily completed.

NON-ESP EQUIPPED AIRPLANES ONLY - When conducting missed approach procedures, autopilot coupled operation is prohibited until the pilot has established a rate-of-climb that ensures all altitude requirements of the procedure will be met.

Minimum speed for autopilot operation is 100 KIAS.

Maximum speed limit for autopilot operation is unchanged from the airplane's maximum airspeed limit (V_{MO}/M_{MO}).

Do not use autopilot below the following altitudes:

(1) On takeoff, do not engage the autopilot below ..... 400 feet Above Ground Level
(2) Enroute ..... 800 feet AGL
(3) Approach (GP or GS Mode) ..... 200 feet AGL
(4) Approach (FLC, VS, PIT or ALT Mode)..... Higher of 400 feet AGL or Approach MDA

SYNTHETIC VISION AND PATHWAYS LIMITS

Use of the Synthetic Vision system display elements alone for aircraft control without reference to the G1000 primary flight instruments or the aircraft standby instruments is prohibited.

Use of the Synthetic Vision system alone for navigation, or obstacle or terrain avoidance is prohibited.

Use of the SVS traffic display alone to avoid other aircraft is prohibited.

TAWS AND TERRAIN SYSTEM LIMITS

Pilots are authorized to deviate from their current ATC clearance to the extent necessary to comply with TAWS warnings.

For airplanes with system software 0636.02 or earlier installed, the TAWS databases have an area of coverage as detailed below:

a) The terrain database has an area of coverage from North 75° Latitude to South 60° Latitude in all longitudes.

b) The airport terrain database has an area of coverage that includes airports from North 75° Latitude to South 60° Latitude in all longitudes.

c) The obstacle database has an area of coverage that includes the United States and Europe.

For airplanes with system software 0636.03 or later installed, the TAWS databases have an area of coverage as detailed below:

a) The terrain database has an area of coverage from North 90° Latitude to South 90° Latitude in all longitudes.

b) The obstacle database has an area of coverage that includes the United States and Europe.

Use of the TAWS for navigation or terrain and/or obstacle avoidance is prohibited.

NOTE

The area of coverage may be modified, as additional terrain data sources become available.

NOTE

The MAP - TAWS page and terrain display is intended to serve as a situational awareness tool only. It may not provide either the accuracy or fidelity, or both, on which to solely base decisions and plan maneuvers to avoid terrain or obstacles.

To avoid unwanted alerts, TAWS should be inhibited when landing at an airport that is not included in the airport database.

TRAFFIC AVOIDANCE SYSTEM LIMITS

Use of the MAP - TRAFFIC MAP to maneuver the airplane to avoid traffic without outside visual reference is prohibited. The Traffic Information System (TIS) or optional TAS or TCAS 1 systems are intended as an aid for the pilot to visually locate traffic. It is the responsibility of the pilot to see and manually maneuver the airplane to avoid other traffic.

DATA LINK WEATHER (XM WEATHER)

Datalink weather information displayed by the G1000 system is limited to supplemental use only. XM weather data is not a source of official weather information. Use of the NEXRAD and XM LTNG data on the MAP – NAVIGATION MAP and/or MAP - WEATHER DATA LINK page for hazardous weather, e.g., thunderstorm penetration is prohibited. NEXRAD, and LTNG information on the MAP - NAVIGATION or MAP – WEATHER DATA LINK page is intended only as an aid to enhance situational awareness of hazardous weather, not penetration. It is the pilot's responsibility to avoid hazardous weather using official weather data sources and the airplane's in-flight weather radar.

Display of XM NEXRAD data is prohibited if XM ICING or XM TURBULENCE are displayed on the MFD MAP- XM WEATHER DATA LINK page. XM ICING and XM TURBULENCE data must be turned off in order to display XM NEXRAD data. For airplanes that have system software 0636.03 or later installed, it is not possible to simultaneously display XM ICING, TURBULENCE and NEXRAD data.

OPTIONAL L3 COMMUNICATIONS AVIONICS SYSTEM WX-500 STORMSCOPE

Stormscope lightning information displayed by the G1000 system is limited to supplemental use only. The use of the Stormscope lightning data on the MAP – NAVIGATION MAP and/or MAP – STORMSCOPE page for hazardous weather (thunderstorm) penetration is prohibited. Stormscope lightning data on the MAP - NAVIGATION or MAP – STORMSCOPE page is intended only as an aid to enhance situational awareness of hazardous weather, not penetration. It is the pilot's responsibility to avoid hazardous weather using official weather data sources and the airplane's weather radar.

PLACARDS

On some aircraft, placards "On Instrument Panel Adjacent to Each Gyroscopic Instrument (Except for Flight Director)" were installed to identify the power source for the instrument (ref. AFM limitations section). With the installation of the G1000, these placards are removed and not required.

On Instrument Panel above the Standby Attitude Indicator:

STANDBY ALT/AS	
ALTITUDE – FEET	V_{MO}-KIAS
S.L TO 16,000	226
16,000 TO 20,000	209
20,000 TO 25,000	189
25,000 TO 30,000	169

KINDS OF OPERATION LIMITS

The Hawker Beechcraft models C90A and C90GT are approved for the following types of operations when the required equipment, as shown in the airplane AFM/POH Kinds of Operations Equipment List, supplemented by the Kinds of Operations Equipment List from other applicable Airplane Flight Manual Supplements, and the Kinds of Operations Equipment List contained in this Airplane Flight Manual Supplement, is installed and operable.

1. VFR Day
2. VFR Night
3. IFR Day
4. IFR Night
5. Icing Conditions

KINDS OF OPERATIONS EQUIPMENT LIST

This airplane may be operated in day or night VFR, day or night IFR, and icing conditions when the required systems and equipment are installed and operable.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated. The system and equipment listed must be installed and operable for the particular kind of operation indicated unless:

The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the FAA.

Or:

An alternate procedure is provided in the Pilots Operating Handbook and FAA Approved Flight Manual for the inoperative state of the listed system or equipment and all limitations are complied with.

Numbers in the Kinds of Operations Equipment List refer to quantities required to be operative for the specified condition. The list does not include all equipment that may be required by specific operating rules. It also does not include components obviously required for the airplane to be airworthy such as wings, empennage, engines, etc.

System and/or Equipment	VFR Day	VFR Night	IFR Day	IFR Night	Icing Conditions	Remarks and/or Exceptions
ELECTRICAL POWER						
Inverter	**0**	**0**	**0**	**0**	**0**	**Removed by G1000 modification**
INVERTER Annunciator	**0**	**0**	**0**	**0**	**0**	**Removed by G1000 modification**
Standby Battery	**0**	**1**	**1**	**1**	**1**	
ENGINE INDICATIONS **No Changes - Refer to Aircraft Flight Manual**						
ENGINE OIL **No Changes - Refer to Aircraft Flight Manual**						
ENVIRONMENTAL						
Air Conditioning System	**0**	**0**	**0**	**0**	**0**	**Temperature limits reduced to 47°C (116°F) with inoperative air conditioner or air conditioner not used.**
FLIGHT CONTROLS **No Changes - Refer to Aircraft Flight Manual**						
FUEL **No Changes - Refer to Aircraft Flight Manual**						
ICE AND RAIN PROTECTION **No Changes - Refer to Aircraft Flight Manual**						
LANDING GEAR **No Changes - Refer to Aircraft Flight Manual**						
LIGHTS **No Changes - Refer to Aircraft Flight Manual**						
NAVIGATION INSTRUMENTS						
Magnetic Compass	**1**	**1**	**1**	**1**	**1**	
Outside Air Temperature	**1**	**1**	**1**	**1**	**1**	
G1000 Integrated Avionics						
Garmin G1000 Cockpit Reference Guide	**1**	**1**	**1**	**1**	**1**	
Autopilot	**0**	**0**	**0**	**0**	**0**	
Electronic Stability & Protection (ESP)	**0**	**0**	**0**	**0**	**0**	
Yaw Damper	**0**	**0**	**0**	**0**	**0**	

System and/or Equipment	VFR Day	VFR Night	IFR Day	IFR Night	Icing Conditions	Remarks and/or Exceptions
Control Wheel Autopilot Disconnect/Trim Interrupt Switches	**1**	**1**	**1**	**1**	**1**	**Left side is required. Both side required for two-crew operation.**
VHF Communications System	**0**	**0**	**1**	**1**	**1**	**Or as required by operating regulation.**
Audio Control Panel	**1**	**1**	**1**	**1**	**1**	**Pilot's audio panel required for single pilot operation. Both sides required for two-crew operation.**
Primary Flight Display	**2**	**2**	**2**	**2**	**2**	
Multi Function Display	**1**	**1**	**1**	**1**	**1**	
Air Data Computer	**2**	**2**	**2**	**2**	**2**	
Attitude/Heading Reference System (AHRS)	**2**	**2**	**2**	**2**	**2**	
Standby Attitude Indicator	**0**	**0**	**1**	**1**	**1**	
Standby Altimeter	**1**	**1**	**1**	**1**	**1**	
Standby Airspeed Indicator	**1**	**1**	**1**	**1**	**1**	
ATC Transponder	**0**	**0**	**1**	**1**	**1**	**Or as required by operating regulation.**
VHF Navigation Receiver	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Automatic Direction Finder (ADF)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Distance Measuring Equipment (DME)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Marker Beacon Receiver	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Terrain Awareness and Warning System (TAWS)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Weather Radar	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
XM Datalink Weather	**0**	**0**	**0**	**0**	**0**	
GDU Cooling Fans (3 total)	**2**	**2**	**2**	**2**	**2**	**All fans are required if OAT is above 40°C (104°F).**
GIA Cooling Fans (2 total)	**0**	**0**	**0**	**0**	**0**	**Both fans are required if OAT is above 40°C (104°F).**

System and/or Equipment	VFR Day	VFR Night	IFR Day	IFR Night	Icing Conditions	Remarks and/or Exceptions
RNAV Operations, Equipment and Components						**Equipment and components required for RNAV 2, RNAV 1, B-RNAV, P-RNAV, Class II navigation, RNP and RNAV routes including Standard Instrument Departures (SIDs) and Obstacle Departure Procedures (ODPs), Standard Terminal Arrival (STAR), and enroute RNAV "Q" and RNAV "T" routes, and "GPS", "or GPS", and "RNAV (GPS)" instrument approach operations.** **NOTE 1: Some operations require two functioning GPS/SBAS receivers.** **NOTE 2: If only one is required, and only one is operative, it must be #1.**
GPS/SBAS receiver with GPS Software 3.2 or later approved version **Note 1, 2	**1**	**1**	**2**	**2**	**2**	
GDU 104X Display	**2**	**2**	**2**	**2**	**2**	
GDU 1500 Display	**1**	**1**	**1**	**1**	**1**	
Comant CI 428-410 antenna	**1**	**1**	**1**	**1**	**1**	
Comant CI 428-200 antenna	**1**	**1**	**1**	**1**	**1**	
OXYGEN **No Changes - Refer to Aircraft Flight Manual**						
PROPELLER **No Changes - Refer to Aircraft Flight Manual**						
VACUUM SYSTEM						
Gyro Suction Gage	**0**	**0**	**0**	**0**	**1**	
Instrument Air System	**0**	**0**	**0**	**0**	**1**	

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Section 3 - Emergency Procedures

Table of Contents

AUTOMATIC FLIGHT CONTROL SYSTEM 30

AUTOPILOT MALFUNCTION / PITCH TRIM RUNAWAY 30

MANUAL AUTOPILOT DISCONNECT 31

AUTOPILOT ABNORMAL DISCONNECT 31

AUTOPILOT FAILURE 31

PITCH AXIS FAILURE 31

ROLL AXIS FAILURE 32

YAW AXIS FAILURE 32

PITCH TRIM FAILURE 32

AUTOPILOT PRE-FLIGHT TEST FAIL 33

AUTOPILOT OVERSPEED RECOVERY 33

AUTOPILOT UNDERSPEED PROTECTION ACTIVATION AND RECOVERY (ESP-Equipped Aircraft Only) 33

ENGINE FAILURE (AUTOPILOT ENGAGED) 34

ELECTRICAL SYSTEM 34

DUAL GENERATOR FAILURE [L GEN OFF] [R GEN OFF] 34

TAWS 36

TAWS WARNING 36

TAWS FAIL 36

WINDSHEAR ENCOUNTER 37

ESP ENGAGEMENT 37

Bolded checklist steps in the EMERGENCY PROCEDURES section indicate pilot memory action items. The pilot shall perform these items without reference to the checklist in this section.

AUTOMATIC FLIGHT CONTROL SYSTEM

AUTOPILOT MALFUNCTION / PITCH TRIM RUNAWAY

These procedures supersede the airplane's UNSCHEDULED ELECTRIC ELEVATOR TRIM AFM checklist items.

If the airplane deviates unexpectedly from the planned flight path:

1. **Control Wheel ..... GRIP FIRMLY**

2. **AP/YD DISC / TRIM INTRPT Button ..... PRESS AND HOLD**
   (Be prepared for possible high elevator control forces)

3. Aircraft Attitude ..... MAINTAIN/REGAIN AIRCRAFT CONTROL
   use standby attitude indicator if necessary

NOTE

Do not release the AP/YD DISC / TRIM INTRPT Button until after pulling the AFCS SERVOS Circuit Breaker.

4. Elevator Trim ..... RETRIM if necessary using Elevator Tab Wheel

5. AFCS SERVOS Circuit Breaker ..... PULL
   (Right circuit breaker panel)

6. AP/YD DISC / TRIM INTRPT Button ..... RELEASE

WARNING

IN FLIGHT, DO NOT OVERPOWER THE AUTOPILOT. THE TRIM WILL OPERATE IN THE DIRECTION OPPOSING THE OVERPOWER FORCE, WHICH WILL RESULT IN LARGE OUT-OF-TRIM FORCES.

DO NOT ATTEMPT TO RE-ENGAGE THE AUTOPILOT OR USE MANUAL ELECTRIC PITCH TRIM UNTIL THE CAUSE OF THE MALFUNCTION HAS BEEN CORRECTED.

NOTE

The maximum altitude lost during malfunction tests was:

Climb – 0 Feet
Cruise – 50 Feet
Descent – 320 Feet
Maneuvering – 0 Feet
Approach – 54 Feet
One-engine inoperative approach – 45 Feet

MANUAL AUTOPILOT DISCONNECT

If necessary, the autopilot can be manually disconnected using any one of the following methods.

1. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Pilot's or Copilot's control wheel)

2. AP Button (Autopilot mode control panel)..... PRESS
   (Yaw damper remains engaged)

3. Pitch Trim Switch (Pilot's or, if installed, Copilot's control wheel)..... ACTIVATE
   (Yaw damper remains engaged)

4. Go-Around (GA) switch..... PRESS
   (Left power lever) (Yaw damper remains engaged)

5. AFCS SERVOS Circuit Breaker..... PULL
   (Right circuit breaker panel)

AUTOPILOT ABNORMAL DISCONNECT

(Red 'AP' flashing on PFD, Continuous high-low aural tone)

1. A/P DISC/TRIM INTRPT Button .....PRESS AND RELEASE
   (to cancel disconnect tone)

2. Aircraft Attitude..... MAINTAIN/REGAIN AIRCRAFT CONTROL

NOTE

The autopilot disconnect may be accompanied by a red boxed PTCH (pitch), ROLL, or AFCS on the PFD, indicating the axis which has failed, or that the automatic flight control system has failed. The autopilot cannot be re-engaged with any of these annunciations present.

AUTOPILOT FAILURE

(Red AFCS annunciator on PFD, Red 'AP' flashing on PFD, Continuous high-low aural tone)

1. AP/YD DISC / TRIM INTRPT Button ..... PRESS
   (to cancel disconnect tone)

   If red 'AFCS' is displayed, the autopilot, yaw damper, and manual electric pitch trim will be inoperative.

PITCH AXIS FAILURE

(Red PTCH annunciator on PFD)

- Indicates a failure of the pitch axis of the autopilot. The autopilot will be inoperative.

NOTE

If the red PTCH annunciator illuminates without the autopilot engaged, it may indicate a faulted AHRS. Monitor both PFDs and the standby attitude indicator for abnormal attitude indications

ROLL AXIS FAILURE

(Red

annunciator on PFD)

- Indicates a failure of the roll axis of the autopilot. The autopilot will be inoperative.

NOTE

If the red

annunciator illuminates without the autopilot engaged, it may indicate a faulted AHRS. Monitor both PFDs and the standby attitude indicator for abnormal attitude indications.

YAW AXIS FAILURE

(Red

annunciator on PFD)

- Indicates a failure of the yaw axis of the autopilot. The pitch and roll axes of the autopilot will remain operative. DO NOT pull and reset the AFCS SERVOS circuit breaker. Resetting the AFCS SERVOS circuit breaker could cause the entire autopilot to become inoperative when no fault exists in the pitch and roll axes.

NOTE

If the red

annunciator illuminates without the autopilot engaged, it may indicate a faulted AHRS. Monitor both PFDs and the standby attitude indicator for abnormal attitude indications.

PITCH TRIM FAILURE

(Red

annunciator on PFD)

1. CONTROL WHEEL ..... GRIP FIRMLY
2. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Be prepared for possible high elevator control forces)
3. Elevator Trim ..... AS REQUIRED USING ELEVATOR TAB WHEEL

If Red

Message Clears

- Autopilot ..... RE-ENGAGE

If Red

Message Remains

4. Autopilot ..... DO NOT RE-ENGAGE
5. Elevator Trim ..... CONTINUE TO USE ELEVATOR TAB WHEEL

AUTOPILOT PRE-FLIGHT TEST FAIL

(Red PFT annunciator on PFD)

- Indicates the AFCS system failed the automatic Pre-Flight test. The autopilot, ESP (if installed), and electric elevator trim are inoperative. Flight Director may still function.

AUTOPILOT OVERSPEED RECOVERY

(Yellow MAXSPD on PFD)

1. **Power.....REDUCE**

When overspeed condition is corrected:

2. Autopilot .....RESELECT VERTICAL MODE (if necessary)

NOTE

Overspeed recovery mode provides a pitch up command to decelerate the airplane at or below the maximum autopilot operating speed (226 KIAS / 0.46 M). Overspeed recovery is not active in altitude hold (ALT), glideslope (GS), or glidepath (GP) modes.

AUTOPILOT UNDERSPEED PROTECTION ACTIVATION AND RECOVERY (ESP-Equipped Aircraft Only)

(Red UNDERSPEED PROTECT ACTIVE Warning Annunciator on the PFDs on ESP-equipped aircraft. May also be accompanied by an amber MINSPD annunciator above the airspeed tape display and aural "AIRSPEED" alert)

1. **Power Levers..... INCREASE POWER AS REQUIRED TO CORRECT UNDERSPEED**
2. **Aircraft Attitude and Altitude.....MONITOR**

After underspeed condition is corrected:

3. Autopilot .....RESELECT VERTICAL AND LATERAL MODES (if necessary)
4. Power Levers .....ADJUST AS NECESSARY

NOTE

Autopilot Underspeed Protection Mode provides a pitch down command to maintain 90 +/-2 KIAS, or 2 KIAS above stall warning airspeed, depending on the vertical mode selected. Underspeed Protection is not available below 200 feet AGL, except in go-around (GA) mode.

ENGINE FAILURE (AUTOPILOT ENGAGED)

1. **AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE**
2. **Engine Failure Procedure in EMERGENCY PROCEDURES Section of AFM ..... COMPLETE**
3. Trim Tabs .....MANUALLY ADJUST ELEVATOR, AILERON, AND RUDDER TABS
4. Autopilot .....PRESS ‘AP’ BUTTON (if desired) to RE-ENGAGE
5. Rudder Tab .....MANUALLY ADJUST AS REQUIRED AFTER POWER AND CONFIGURATION CHANGES

ELECTRICAL SYSTEM

DUAL GENERATOR FAILURE [L GEN OFF] [R GEN OFF]

This procedure supersedes the AFM procedure in its entirety.

1. Gen1 and Gen2 Generator Switches.....OFF
2. Gen1 Switch.....GEN RESET, THEN ON
3. Operating Generator .....DO NOT EXCEED 100% LOAD

If Left Generator Will Not Reset:

4. Gen1 Switch.....OFF
5. Gen2 Switch.....GEN RESET, THEN ON
6. Operating Generator .....DO NOT EXCEED 100% LOAD

If Neither Generator Will Reset:

7. Avoid IFR conditions if possible and LAND AT THE NEAREST SUITABLE AIRPORT.
8. Standby Battery Switch..... INDICATES ARM or ON
9. Non-essential equipment:
    a. Left and Right BOOST PUMP……OFF
    b. Left and Right TRANS. PUMP OVERRIDE……..OFF
    c. ENG AUTO IGNITION……..OFF
    d. PROP ICE PROTECTION……...OFF
    e. All Exterior Lights……..OFF
    f. Cabin Lights……OFF

g. VENT BLOWER……..AUTO

h. CABIN TEMP MODE selector……OFF

i. INSTRUMENT EMERG LIGHTS……ON (if required)

j. INSTRUMENT INDIRECT lights……ON (if required)

10. The following equipment will be functional while the G1000 is powered from the aircraft's battery power, Avionics Master Power Switch is ON, and the [L GEN TIE OPEN] and [R GEN TIE OPEN] annunciators are illuminated.

    Pilot's Attitude, Heading, Air Data, and Nav CDI
    Copilot's Attitude, Heading, Air Data, and Nav CDI
    Engine Gauges
    Com1, Pilot's Audio Panel
    GPS 1, GPS 2, VHF Nav1, VHF Nav2 (Nav2 Audio Inop)
    MFD, Flight Director, Transponder 1

NOTE

Inoperative G1000 equipment items will be displayed in the ALERTS window on both PFDs.

The aircraft's battery will continue to power the G1000 equipment for 30 minutes following complete loss of normal electrical power generation. Once the aircraft's battery can no longer power the G1000, the standby battery will automatically power the standby attitude indicator, altimeter vibrator, and the internal lighting of the three standby instruments for an additional 30 minutes.

11. Consider a Flaps UP Landing and Landing Gear Manual Extension to conserve battery power for an instrument approach if needed.

TAWS

TAWS WARNING

(Red

on PFD and aural “PULL UP”)

1. **AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE**
   (To disconnect the autopilot)
2. **Aircraft Attitude ..... PULL BACK ON CONTROL WHEEL**
3. **Power ..... MAXIMUM ALLOWABLE**
4. **Airspeed ..... BEST ANGLE OF CLIMB SPEED**

After Warning Ceases

5. Power ..... MAXIMUM CONTINUOUS
6. Altitude ..... CLIMB AND MAINTAIN SAFE ALTITUDE
7. Advise ATC of Altitude Deviation, if appropriate

NOTE

Only vertical maneuvers are recommended, unless either operating in visual meteorological conditions (VMC), or the pilot determines, based on all available information, that turning in addition to the escape maneuver is the safest course of action, or both.

TAWS FAIL

(Red

on PFD and MFD)

Indicates the G1000 will no longer provide TAWS alerting or display relative terrain elevation. The crew must maintain compliance with procedures that ensure minimum terrain and obstacle separation.

WINDSHEAR ENCOUNTER

For airplanes equipped with Electronic Stability and Protection (ESP):

1. **AP/YD DISC / TRIM INTRPT Button ..... PRESS and HOLD (To prevent automatic autopilot engagement)**

2. **Perform established windshear escape procedures.**

After Exiting Windshear:

3. AP/YD DISC / TRIM INTRPT Button ..... RELEASE

4. Autopilot/Yaw Damper ..... AS DESIRED

NOTE

Refer to FAA Advisory Circular 00-54, Pilot Windshear Guide for additional information on windshear avoidance and escapement techniques.

ESP ENGAGEMENT

For airplanes equipped with Electronic Stability and Protection (ESP):

1. **Use the flight controls and power levers as required to correct the abnormal flight condition.**

NOTE

If the airplane remains within the ESP engagement envelope for more than approximately 10 seconds, the autopilot will automatically engage in LVL mode, and will be accompanied by an aural “ENGAGING AUTOPILOT” alert. Refer to Section 7 – Systems Description, “Electronic Stability & Protection” (ESP) for further information.

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Section 3A - Abnormal Procedures
Table of Contents

AUTOMATIC FLIGHT CONTROL SYSTEM 41

AILERON MIS-TRIM 41
ELECTRIC PITCH TRIM INOPERATIVE 41
ELEVATOR MIS-TRIM 42
RUDDER MIS-TRIM 43
FLASHING AMBER MODE ANNUNCIATION 44
YAW DAMPER AUTOMATIC DISCONNECT (Amber Flashing 'YD') 44

ELECTRONIC STABILITY AND PROTECTION 44

MANUAL ESP DISENGAGEMENT 44

G1000 INTEGRATED AVIONICS SYSTEM 45

ALTITUDE MISCOMPARE 45
AIRSPEED MISCOMPARE 47
PITCH MISCOMPARE 48
ROLL MISCOMPARE 48
HEADING MISCOMPARE 48

DISPLAY UNIT FAILURE 49

PFD FAILURE 49
MFD FAILURE 50
DUAL GPS/SBAS FAILURE (AMBER "DR" OR "LOI" ON HSI) 51
GPS APPROACH ALARM LIMITS EXCEEDED 52
ILS DATABASE FREQUENCY AND/OR COURSE MISMATCH 53
LOSS OF RADIO TUNING FUNCTIONS 53
FAILED AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED 54
FAILED ATTITUDE AND/OR HEADING 54
ENGINE INDICATION SYSTEM (EIS) FAILURE 56
LOSS OF NAVIGATION DATA 56
INACCURATE FLIGHT DIRECTOR DISPLAY 56
BOTH ON ADC1, BOTH ON ADC2 57
BOTH ON AHRS 1, BOTH ON AHRS 2 57
BOTH ON GPS 1, BOTH ON GPS 2 57
USING ADC1 or ADC2 or XSIDE ADC 58

USING AHRS1 or AHRS2 or XSIDE AHRS **58**

SYNTHETIC VISION **58**

TAWS ABNORMAL PROCEDURES **59**

TAWS CAUTION **59**

TAWS INHIBIT **59**

TAWS N/A and TAWS FAIL **59**

AUTOMATIC FLIGHT CONTROL SYSTEM

AILERON MISTRIM (amber ←AIL or AIL→ annunciation on PFD)

Indicates a mistrim of the ailerons while the autopilot is engaged. The autopilot cannot trim the airplane in roll. During large changes in airspeed, engine failure, or single engine operation, illumination of this message may occur. If the autopilot is disconnected while this message is displayed, high roll forces are possible. The following procedure should be followed:

1. Control Wheel ..... GRIP FIRMLY

2. Aileron Tab Knob ..... ROTATE SLOWLY IN DIRECTION OF INDICATED MISTRIM UNTIL THE ANNUNCIATION EXTINGUISHES

If the annunciator stays extinguished and no other annunciations illuminate:

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

If the annunciator remains illuminated or reappears with no changes in airspeed or configuration from the previous trimmed condition:

3. Control Wheel ..... GRIP FIRMLY

4. Aileron Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

5. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE (Pilot's or Copilot's control wheel)

6. Aileron Trim ..... USING AILERON TAB KNOB, MANUALLY RETRIM AIRPLANE

Autopilot should be considered inoperative until the cause of the mis-trim has been investigated and corrected. Yaw damper may be re-engaged and used normally.

ELECTRIC PITCH TRIM INOPERATIVE

NOTE

This condition may be accompanied by a red AFCS or PTRM annunciation on the PFDs.

1. Move both halves of pilot and copilot pitch trim switches to check for stuck switch

2. AFCS SERVOS Circuit Breaker ..... PULL and RESET (Right circuit breaker panel)

The autopilot will enter Pre-Flight Test (PFT) mode when the AFCS SERVOS circuit breaker is reset. If the autopilot successfully completes the Pre-Flight Test, re-engage the autopilot, reselect the desired autopilot modes, and continue to use normally. If the Pre-Flight Test fails, indicated by a red PFT on the PFDs, the autopilot, yaw damper, and electric pitch trim will be inoperative for the remainder of the flight.

If still inoperative:

- Pitch Trim ..... MANUALLY TRIM AIRPLANE IN PITCH
  (Using Elevator Tab Wheel)

NOTE

Autopilot and yaw damper may also be inoperative.

If Operative:

- Use as required

ELEVATOR MISTRIM (amber ↓ELE or ↑ELE annunciation on PFD)

Indicates a mistrim of the elevator tab while the autopilot is engaged. The autopilot will normally trim the airplane as required. However, during rapid acceleration, deceleration, or configuration changes, momentary illumination of this message may occur accompanied by minor fluctuations in flight path. If the autopilot is disconnected while this message is displayed, high elevator control forces are possible. In the event of sustained illumination, the following procedure should be followed:

1. Control Wheel ..... GRIP FIRMLY

2. Elevator Tab Wheel..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

If the annunciator stays extinguished and no other annunciations illuminate:

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

If the annunciator remains illuminated or reappears with no changes in airspeed or configuration from the previous trimmed condition:

3. Control Wheel ..... GRIP FIRMLY

4. Elevator Tab Wheel..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

5. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Pilot's or Copilot's control wheel)

6. Pitch Trim ..... USING ELEVATOR TAB WHEEL, MANUALLY RETRIM AIRPLANE

   Autopilot should be considered inoperative until the cause of the mistrim has been investigated and corrected. Yaw damper may be re-engaged and used normally.

RUDDER MISTRIM (amber ←RUD or RUD→ annunciation on PFD)

Indicates a mistrim of the rudder while the autopilot is engaged. The autopilot cannot trim the airplane in yaw. During large changes in airspeed, engine failure, or single engine operation, illumination of this message may occur. If the autopilot is disconnected while this message is displayed, high rudder pedal forces and yawing motion are possible. The following procedure should be followed:

1. Rudder Pedals ..... HOLD FIRMLY
2. Rudder Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

If the annunciator stays extinguished and no other annunciations illuminate:

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

If the annunciator remains illuminated or reappears with no changes in airspeed or configuration from the previous trimmed condition:

3. Rudder Pedals ..... HOLD FIRMLY
4. Rudder Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MIS-TRIM UNTIL ANNUNCIATION EXTINGUISHES
5. YD Button ..... PRESS on Mode Controller
6. Rudder Tab Knob ..... MANUALLY RETRIM AIRPLANE

Yaw Damper should be considered inoperative until the cause of the mistrim has been investigated and corrected. The Autopilot can continued to be used normally without the Yaw Damper.

FLASHING AMBER MODE ANNUNCIATION

NOTE

Abnormal mode transitions (those not initiated by the pilot or by normal sequencing of the AFCS) will be annunciated by flashing the disengaged mode in amber on the PFD. Upon loss of a selected mode, the system will revert to the default mode for the affected axis, either ROL or PIT. After 10 seconds, the new mode (PIT or ROL) will be annunciated in green.

Loss of selected vertical mode (FLC, VS, VPTH, ALT, GS, GP)

1. Autopilot mode controls.....SELECT ANOTHER VERTICAL MODE

If on an instrument approach, disconnect autopilot and continue manually or execute missed approach:

2. AP/YD DISC / TRIM INTRPT Button .....PRESS and RELEASE

Loss of selected lateral mode (HDG, VOR, GPS, LOC, VAPP, BC):

1. Autopilot mode controls..... ..... SELECT ANOTHER LATERAL MODE

If on an instrument approach, disconnect autopilot and continue manually or execute missed approach:

2. AP/YD DISC / TRIM INTRPT Button .....PRESS and RELEASE

YAW DAMPER AUTOMATIC DISCONNECT (Amber Flashing 'YD')

Flashing amber 'YD' in flight indicates that yaw damper has disconnected. If the disconnect was not pilot initiated, the yaw servo has failed. Do not reset the AFCS SERVOS circuit breaker in an effort to reset the yaw servo. The autopilot pitch and roll modes will continue to function without the yaw damper engaged.

ELECTRONIC STABILITY AND PROTECTION

MANUAL ESP DISENGAGEMENT

If necessary, ESP may be manually disconnected using any one of the following methods.

1. AP/YD DISC / TRIM INTRPT Button .....PRESS and HOLD
   (Pilot's or Copilot's control wheel)
2. CWS Button (Pilot's or Copilot's control wheel).....PRESS and HOLD
3. AFCS SERVOS Circuit Breaker.....PULL
   (Right circuit breaker panel)
4. AUX – SYSTEM SETUP 2 Page on MFD..... DISABLE STABILITY AND PROTECTION

ALTITUDE MISCOMPARE

This message is displayed when the G1000 detects a difference of 200 feet or greater between the pilot's and copilot's altitude information. Refer to the G1000 Cockpit Reference Guide for additional information.

1. Altimeter Settings ..... VERIFY both pilot and copilot have the correct barometric altimeter setting.
2. Pilot's and Copilot's Altitude ..... COMPARE with Standby Altimeter

WARNING

THE STANDBY ALTIMETER USES THE SAME STATIC SOURCE AS THE COPILOT'S SIDE AIR DATA COMPUTER (ADC2). DO NOT USE STANDBY ALTIMETER AS SOLE SOURCE IN DETERMINING CORRECT ALTITUDE.

If Pilot and Standby Altimeter *Agree (Copilot Altimeter Differs):*

3. SENSOR Softkey (Copilot PFD) ..... PRESS
4. ADC1 Softkey ..... PRESS
5. PFD Displays ..... CONFIRM annunciator is displayed on both PFDs.

If Copilot and Standby Altimeter Agree (Pilot Altimeter Differs):

3. Pilot's Static Air Source ..... SELECT ALTERNATE

   A sudden sustained change in rate-of-climb indication accompanied by abnormal indicated airspeed and altitude changes beyond normal calibrated differences observed on the Pilot's PFD would indicate a blockage of the pilot's static system.

   - If Pilot's PFD and Copilot's PFD agree within normal calibrated differences with Pilot's Alternate Static Air Source in the ALTERNATE position:

     Refer to Section 5, PERFORMANCE in the airplanes AFM for Airspeed Calibration and Altimeter Correction.

If no change in rate-of-climb, airspeed, or altitude is observed:

4. Pilot's Static Air Source ..... SELECT NORMAL
5. Compare indicated altitude to GPS altitude on MFD AUX-GPS STATUS page to aid in determining which primary system is most accurate.

NOTE

When comparing indicated altitude to GPS altitude, deviations from standard temperature or pressure can cause indicated altitude to deviate from GPS altitude. These errors are largest at high altitude. Below 10,000 feet with the correct local altimeter setting set, GPS altitude will usually be within 600 feet or better of the correct indicated altitude. Use the following guidelines to help estimate correct altitude from non-standard conditions:

- Temperatures WARMER than standard can cause GPS altitude to read HIGHER than indicated altitude.
- Pressures LOWER than standard can cause GPS altitude to read HIGHER than indicated altitude.

If Able to Identify Accurate Altitude Source:

6. Autopilot ALT Mode.....DISENGAGED
7. Use SENSOR softkey to select most accurate ADC on both PFD's
8. Confirm

or

annunciators are displayed on both PFDs
9. Autopilot ALT Mode.....ENGAGE AS DESIRED

If Unable to Identify Accurate Altitude Source:

6. Avoid IFR conditions if possible; consider diversion to visual conditions and LAND AS SOON AS PRACTICAL.
7. Maintain altitudes based on LOWEST indicated altitude.
8. ATC – Advise of inability to verify correct altitude
9. If unable to descend into visual conditions, plan an ILS, LPV, or RNAV (GPS) LNAV/VNAV approach with course intercept well outside the Final Approach Fix (FAF).
10. Once glideslope or glidepath is captured, determine most accurate altitude source when crossing FAF.
11. Reference ILS Decision Altitude or GPS based approach Minimum Descent Altitude to most accurate altimeter based on FAF crossing.

WARNING

TAWS ALERTS ARE BASED ON GPS ALTITUDE AND POSITION INFORMATION. TAWS WARNINGS AND CAUTIONS ARE INDEPENDENT OF ADC DATA. IF A TAWS WARNING OR CAUTION IS RECEIVED, CONSIDER IT ACCURATE AND TAKE IMMEDIATE AVOIDANCE ACTION.

AIRSPEED MISCOMPARE IAS MISCOMP

This message is displayed when the G1000 detects a difference of 7 KIAS or greater between the pilot's and copilot's airspeed indicators (10 KIAS difference during takeoff or landing roll). Refer to the G1000 Cockpit Reference Guide for additional information.

1. Pilot's and Copilot's Airspeed ..... COMPARE with Standby Airspeed Indicator.

WARNING

THE STANDBY AIRSPEED INDICATOR USES THE SAME PITOT-STATIC SOURCES AS THE COPILOT'S SIDE AIR DATA COMPUTER (ADC2). DO NOT USE STANDBY AIRSPEED INDICATOR OR STANDBY ALTIMETER AS SOLE SOURCE IN DETERMINING CORRECT AIR DATA INFORMATION.

If Pilot and Standby Airspeed Indicator Agree (Copilot Airspeed Differs):

2. SENSOR Softkey (Copilot's PFD) ..... PRESS
3. ADC1 Softkey ..... PRESS
4. PFD Displays ..... CONFIRM BOTH ON ADC1 annunciator is displayed on both PFDs.

If Copilot and Standby Airspeed Indicator Agree (Pilot Airspeed Differs):

2. Pilot and Copilot ALTITUDE ..... NOTE

If Pilot's and Copilot's Altitude Agree:

3. Airspeed 120 KIAS MINIMUM on slowest indicator
4. Monitor all three airspeed indicators during changes in power or altitude to determine which indicators are inaccurate. Indications of inaccurate airspeed include:
   - No change in indicated airspeed when power change and altitude maintained.
   - Indicated airspeed increases when climbing or decreases when descending.
5. Use SENSOR softkey to select most accurate ADC on the affected PFDs
6. Airspeed ..... RESUME NORMAL SPEEDS

If Pilot's and Copilot's Altitude Do Not Agree:

1. Refer to Abnormal Procedures, ALT MISCOMP procedure to determine most accurate ADC.

PITCH MISCOMPARE PIT MISCOMP

This message is displayed in the upper right corner of the PFD when the G1000 detects a difference between the pilot's and copilot's pitch attitude of more than 5 degrees. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. Refer to STANDBY ATTITUDE indicator to determine which AHRS is providing the most accurate data.

2. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.

ROLL MISCOMPARE ROLL MISCOMP

This message is displayed in the upper right corner of the PFD when the G1000 detects a difference between the pilot's and copilot's roll attitude of more than 6 degrees. Refer to the GARMIN G1000 Cockpit Reference Guide for additional information.

1. Refer to STANDBY ATTITUDE indicator to determine which AHRS is providing the most accurate data.

2. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.

HEADING MISCOMPARE HDG MISCOMP

This message is displayed when the G1000 detects a difference between the pilot's and copilot's heading information (displayed in the upper right of the PFD). Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. WSHLD ANTI-ICE Switches (PILOT and COPILOT) ..... OFF
2. CABIN TEMP MODE selector ..... OFF
3. ELEC HEAT ..... OFF
4. Refer to Magnetic Compass to determine which AHRS is providing the most accurate heading information.
5. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.
6. WSHLD ANTI-ICE Switches ..... AS REQUIRED
7. CABIN TEMP MODE ..... AS DESIRED
8. ELEC HEAT ..... AS REQUIRED

NOTE

The magnetic compass is affected by windshield anti-ice, air conditioner, and electric heat. These items must be turned OFF prior to referencing magnetic compass heading, and then may be reselected ON. With windshield anti-ice OFF, windshield may form fog or frost on the inside surface. The windshield anti-ice should be turned off only long enough to reference magnetic compass or the pilot should descend to a warmer altitude if terrain, fuel, and endurance permit.

DISPLAY UNIT FAILURE

PFD FAILURE

PFD failure is indicated by a complete loss of image on a display. The pilot should use the cross side PFD and the standby flight instruments for information to fly the airplane. If only individual elements of the display are failed, refer to appropriate procedures for the individual failures.

To display a composite display of primary flight information and the engine instruments on the MFD:

1. DISPLAY BACKUP Button (on audio panel of affected side) ..... PRESS

   The DISPLAY BACKUP button can be pressed again to return the MFD to its normal presentation. With the MFD in its normal display presentation, the pilot has access to functions and pages unique to the MFD that are not accessible when the MFD is in the composite display.

NOTE

The CDI SYNC and BARO SYNC settings must be ON to allow the operating PFD's controls to affect settings on the MFD when the MFD is in the Display Backup mode. These settings are accessible on the MFD when in the normal display presentation on the AUX – SYSTEM SETUP page.

2. Autopilot Mode Panel ..... TRANSFER (XFR button) to operating PFD
3. Autopilot ..... RE-ENGAGE and select modes
4. Transponder ..... SELECT operating transponder
5. Audio Panels ..... SELECT operating COM Radio

NOTE

Use the operating PFD to control Com frequency selection, Com and Nav volume, and Altimeter Barometric Pressure setting.

MFD FAILURE

MFD failure is indicated by a complete loss of image on the center display.

1. Pilot's Audio Panel DISPLAY BACKUP Button ..... PRESS
2. Copilot's Audio Panel DISPLAY BACKUP Button ..... PRESS

NOTE

Engine data will be displayed on both PFDs

3. Electronic Chart Data will not be available following an MFD failure. Use the following procedure if a secondary source of aeronautical information is not available in the airplane.

   a. Load approaches, arrivals, and departures into the Active Flight Plan using the PROC button on either PFD. The procedure's course can be displayed on either PFD's Inset Map window. Navigate using the course pointer and CDI on the PFDs.

   b. For instrument approach procedures, obtain altitude information from ATC using either COM radio.

DUAL GPS/SBAS FAILURE (AMBER “DR” OR “LOI” ON HSI)

LOSS OF GPS/SBAS NAVIGATION DATA

When both GPS/SBAS receivers are inoperative or GPS navigation information is not available or invalid, the G1000 system will enter one of two modes: Dead Reckoning mode (DR) or Loss Of Integrity mode (LOI). The mode is indicated on the HSI by an amber “DR” or “LOI”. Which mode is active depends on the distance from the destination airport in the active flight plan.

If the LOI annunciation is displayed, revert to an alternate means of navigation appropriate to the route and phase of flight or periodically cross-check the GPS guidance to other, approved means of navigation.

In Dead Reckoning mode, the MAP – NAVIGATION MAP will continue to be displayed with a ghosted aircraft icon in the center and an amber ‘DR’ overwriting the icon. Aircraft position will be based upon the last valid GPS position, then estimated by Dead Reckoning methods. Changes in true airspeed, altitude, or winds aloft can affect the estimated position substantially. Dead Reckoning is only available in Enroute mode; Terminal and Approach modes do not support DR. Course deviation information will be displayed as an amber CDI on both PFDs and will remain for up to 20 minutes after GPS position data has been lost. The autopilot and/or flight director may be coupled in GPS mode while the system is in Dead Reckoning mode. Refer to the G1000 Cockpit Reference Guide for further information. Revert to an alternate means of navigation appropriate to the route and phase of flight.

If Alternate Navigation Sources (ILS, LOC, VOR, DME, ADF) Are Available:

1. Navigation ..... USE ALTERNATE SOURCES

If No Alternate Navigation Sources Are Available:

DEAD RECKONING (DR) MODE - ACTIVE WHEN THE AIRPLANE IS GREATER THAN 30 NM FROM THE DESTINATION AIRPORT.

2. Navigation - Use the airplane symbol and magenta course line on the map display.

NOTE

- ALL INFORMATION NORMALLY DERIVED FROM GPS TURNS AMBER. ALL OF THIS INFORMATION WILL BECOME LESS ACCURATE OVER TIME.
- TAWS IS INOPERATIVE
- DR mode uses heading, true airspeed, last known wind data, and the last known GPS position to estimate the airplane’s current position. DR information will be available for a maximum of 20 minutes.
- MAP – TRAFFIC MAP display is not dependent on GPS information. The position of displayed traffic relative to the airplane symbol on the map is still accurate.

LOSS OF INTEGRITY (LOI) MODE - ACTIVE WHEN THE AIRPLANE IS WITHIN 30NM OF THE DESTINATION OR DEPARTURE AIRPORT (AS CALCULATED FROM THE PREVIOUS GPS OR DR POSITION).

1. Navigation - Fly towards known visual conditions. Use ATC or other information sources as possible.

NOTE

- All information derived from GPS or DR will be removed from the displays
- TAWS IS INOPERATIVE.
- The airplane symbol is removed from all maps. The map will remain centered at the last known position. “NO GPS POSITION” will be annunciated in the center of the map.

GPS APPROACH ALARM LIMITS EXCEEDED

During a GPS LPV, LNAV/VNAV, or LNAV+V approach, if the Horizontal or Vertical alarm limits are exceeded, the G1000 System will downgrade the approach. This will be annunciated in the ALERTS window and by an annunciation change on the HSI from LPV, L/VNAV, or LNAV+V to LNAV. GPS glide path vertical guidance will be removed from the PFD. The approach may be continued using the LNAV only minimums.

During any GPS approach in which both precision and non-precision alarm limits are exceeded, the G1000 System will flag the lateral guidance and display a system message “ABORT APPROACH loss of navigation”. Immediately upon viewing the message, the unit will revert to Terminal navigation mode alarm limits. If the position integrity is within these limits lateral guidance will be restored and the GPS may be used to execute the missed approach, otherwise alternate means of navigation must be utilized.

ILS DATABASE FREQUENCY AND/OR COURSE MISMATCH

In some rare instances, the actual course and/or frequency for an ILS localizer may not match the course or frequency stored in the G1000 database. This occurs most often when an ILS course or frequency change is made by the FAA in between Jeppesen database update cycles. Manual course or frequency changes can be made to override the auto-loaded values in the G1000 database whenever an ILS approach is loaded into the G1000 via the FMS. ADVISORY messages will post in the ALERTS window on the PFDs prompting the pilot verify course and/or frequency information. Use the latest published instrument approach procedure information to verify all course and frequency information.

While flying ILS approaches with manually overridden course or frequency information:

- If SVS Pathways are turned on for display, they must be turned off prior to turning inbound onto the final approach course to prevent possible confusion. This is because the pathway display is also dependent on accurate database information to display proper guidance.

If SVS Pathways are Displayed While Flying a Manually Overridden Frequency or Course on an ILS Approach:

Prior to Turning Inbound on the Final Approach Course*:*

1. PFD Softkey on PFD1 and/or PFD2 ..... PRESS
2. SYN VIS Softkey ..... PRESS
3. PATHWAY Softkey ..... PRESS TO REMOVE PATHWAY DISPLAY

LOSS OF RADIO TUNING FUNCTIONS

1. COM Frequency Toggle Button ..... PRESS AND HOLD FOR 2 SECONDS.

NOTE

This procedure will tune the active COM field to the emergency frequency 121.5. Certain failures of the tuning system will automatically tune 121.5 without pilot action.

FAILED AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED

(RED "X" ON PFD AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED INDICATORS)

This indicates a loss of valid air data computer information to the respective system.

If Both Sides:

1. Airspeed and Attitude ..... MONITOR using standby indicators
2. Land as soon as practical

If One Side Only:

1. Autopilot ALT Mode ..... DISENGAGED
2. Affected PFD SENSOR Softkey ..... PRESS
3. ADC Softkey ..... PRESS the ADC softkey to select the functional ADC (ADC1 or ADC2)
4. Both PFDs ..... CONFIRM “BOTH ON ADC1” OR “BOTH ON ADC 2” annunciated on both PFDs.
5. Autopilot ALT Mode ..... RESELECT AS DESIRED

FAILED ATTITUDE AND/OR HEADING

(ATTITUDE FAIL AND/OR RED "X" OVER HEADING DISPLAY ON PFD)

This indicates a loss of pitch, roll, and/or heading information from AHRS. Refer to GARMIN G1000 Cockpit Reference Guide and Pilot’s Guide for additional information. Interference from GPS repeaters operating inside nearby hangars or magnetic anomalies caused by nearby structures can cause an intermittent loss of attitude and heading displays while the aircraft is on the ground. This is usually accompanied by a BOTH ON GPS 1, BOTH ON GPS 2, or LOI annunciation. Moving the aircraft more than 100 yards away from the source of the interference should alleviate the condition.

Taxiing the aircraft before a valid GPS position has been acquired can cause attitude and/or heading display to indicate a failed condition. As soon as the aircraft acquires a valid GPS position, attitude and heading should return to normal.

WARNING

DO NOT TAKE OFF WITHOUT VALID, NORMAL ATTITUDE AND HEADING DISPLAYS

In Flight, If Both Sides:

1. Attitude ..... MONITOR using standby attitude gyro.
2. WSHLD ANTI-ICE Switches (Pilot and Copilot) ..... OFF

NOTE

The magnetic compass is erratic when either windshield anti-ice, air conditioner, or electric heat is on. With windshield anti-ice OFF, windshield may form fog or frost on the inside surface. The windshield anti-ice should be turned off only long enough to reference magnetic compass or the pilot should descent to a warmer altitude if terrain, fuel, and endurance permit.

3. ELEC HEAT ..... OFF
4. CABIN TEMP MODE switch ..... OFF
5. Heading ..... MONITOR using magnetic compass
6. Land as soon as practical

NOTE

- The autopilot will disconnect and will not re-engage.
- Reference the GPS track on MFD/PFD map to improve situational awareness. GPS will continue to display correct GPS based map, position, and track.
- Magnetic compass is influenced by windshield anti-ice, air conditioner, and electric heat. These items must be turned OFF prior to referencing magnetic compass heading. Leave these items OFF when maneuvering the aircraft by reference to the magnetic compass.

In Flight, If One Side Only:

1. Standby Attitude Gyro ..... MONITOR
2. Affected PFD SENSOR softkey ..... PRESS
3. AHRS softkey ..... PRESS Opposite Side AHRS softkey
4. Both PFDs ..... CONFIRM VALID ATTITUDE AND HEADING ARE DISPLAYED
   CONFIRM "BOTH ON AHRS1" or
   "BOTH ON AHRS2" annunciated on both PFDs

NOTE

The autopilot will disconnect and will not re-engage.

ENGINE INDICATION SYSTEM (EIS) FAILURE

(RED 'X' ON ENGINE DISPLAY)

If All Engine Gauges on One Engine Red 'X':

Indicates failure of the GEA for that engine

1. Check ENG INST circuit breaker ..... RESET once if tripped

If unable to restore engine gauges:

2. Move both power levers together using the engine with operating engine gauges to set power.

If One or More Engine Parameter Indications Are Flagged On Only One Engine:

1. Adjust power using the remaining indications and comparing to the opposite engine.

LOSS OF NAVIGATION DATA

(LATERAL DEVIATION BAR NOT PRESENT AND/OR GLIDESLOPE INDEX CLEARS)

This indicates a loss of data from the selected NAV source. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. CDI Softkey .....PRESS TO SELECT ALTERNATE NAVIGATION SOURCE
2. CONFIRM a valid navigation source is displayed giving valid navigation guidance.

INACCURATE FLIGHT DIRECTOR DISPLAY

Indicated by one or both flight directors commanding attitude contrary to intended flight path

1. AP/YD DISC / TRIM INTRPT Button .....PRESS
   (Pilot's or Copilot's control wheel)
2. Attitude ..... CROSSCHECK BOTH PFDs with the Standby Attitude Indicator
3. Flight Director Modes.....RESELECT AS DESIRED

NOTE

If continued use of the flight director is desired, it is recommended that only basic modes (i.e., ROL and PIT) be selected initially. If this proves satisfactory, HDG and ALT may then be selected. Ensure navigation systems are set up correctly prior to attempting to engage NAV mode.

4. Autopilot .....ENGAGE AS DESIRED if flight director commands are appropriate

If unable to restore Flight Director:

5. FD Button .....PRESS to remove Flight Director from PFDs

BOTH ON ADC1, BOTH ON ADC2

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same Air Data Computer. Normally the pilot's side displays ADC 1 information and the copilot's side displays ADC 2 information. Refer to GARMIN G1000 Cockpit Reference Guide and Pilot's Guide for additional information.

1. PFD (displaying data from opposite ADC) SENSOR softkey ..... PRESS
2. ADC1 or ADC 2 softkey ..... SELECT on-side ADC (ADC1 for Pilot PFD, ADC2 for copilot PFD).
3. PFD Displays ..... CONFIRM "BOTH ON ADC 1" or "BOTH ON ADC 2" message clears on both PFDs.
4. If message does not clear, refer to Abnormal Procedures - FAILED AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED.

BOTH ON AHRS 1, BOTH ON AHRS 2

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same Attitude Heading Reference System. Normally the pilot's side displays AHRS 1 information and the copilot's side displays AHRS 2 information. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PFD (displaying data from opposite AHRS) SENSOR softkey ..... PRESS
2. AHRS1 or AHRS2 softkey ..... Select on-side AHRS (AHRS1 for Pilot PFD, AHRS2 for copilot PFD).
3. PFD Displays ..... CONFIRM "BOTH ON AHRS 1" or "BOTH ON AHRS 2" message clears on both PFDs
4. If message does not clear, refer to Abnormal Procedures - FAILED ATTITUDE AND/OR HEADING.

BOTH ON GPS 1, BOTH ON GPS 2

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same GPS/SBAS receiver. Normally the pilot's side displays GPS 1 and the copilot's side displays GPS 2 and is not pilot selectable. This may be caused by operation outside of WAAS satellite coverage in which case the non-selected GPS is still available in the event the active GPS fails. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. GPS/SBAS Status ..... CHECK
   a. Select AUX - GPS STATUS page on MFD
   b. Select GPS1 then GPS2 softkeys and verify sufficient satellite reception.

USING ADC1 or ADC2 USING ADC1 USING ADC2 or XSIDE ADC XSIDE ADC

This message is displayed on both PFDs and indicates that both PFDs are displaying data from the opposite side Air Data Computer. Normally the pilot's side displays ADC 1 and the copilot's side displays ADC 2. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PILOT'S PFD SENSOR Softkey ..... PRESS
2. PILOT'S PFD ADC1 Softkey ..... PRESS
3. PFD Displays ..... CONFIRM "BOTH ON ADC1" message displayed on both PFDs
4. COPILOT'S PFD SENSOR Softkey ..... PRESS
5. COPILOT'S PFD ADC2 Softkey ..... PRESS
6. PFD Displays ..... CONFIRM "BOTH ON ADC 1" message clears on both PFDs

USING AHRS1 or AHRS2 USING AHRS1 USING AHRS2 or XSIDE AHRS XSIDE AHRS

This message is displayed on both PFDs and indicates that both PFDs are displaying data from the opposite side Attitude Heading Reference System. Normally the pilot's side displays AHRS 1 and the copilot's side displays AHRS 2. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PILOT'S PFD SENSOR Softkey ..... PRESS
2. PILOT'S PFD AHRS1 Softkey ..... PRESS
3. PFD Displays ..... CONFIRM "BOTH ON AHRS1" message displayed on both PFDs
4. COPILOT'S PFD SENSOR Softkey ..... PRESS
5. COPILOT'S PFD AHRS2 Softkey ..... PRESS
6. PFD Displays ..... CONFIRM "BOTH ON AHRS 1" message clears on both PFDs

SYNTHETIC VISION

If SVS displays information inconsistent with G1000 primary flight instrumentation:

On the PFD:

1. PFD softkey ..... PRESS
2. SYN VIS softkey ..... PRESS
3. SYN TERR key ..... PRESS
4. SVS is removed from both PFD displays ..... VERIFY

Use G1000 primary displays for navigation and aircraft control.

If G1000 operation in display backup mode is required:

Select display backup mode on the G1000 system. When display backup mode is selected, the MFD will initially present a non-SVS (blue sky over solid brown ground) display. SVS will be presented on the backup display within 20 seconds if it was enabled on the PFD when display backup was selected.

TAWS ABNORMAL PROCEDURES

TAWS CAUTION TERRAIN

When a TAWS CAUTION occurs, take positive corrective action until the alert ceases. Stop descending or initiate either a climb or a turn, or both, as necessary, based on analysis of all available instruments and information.

TAWS INHIBIT TAWS INH

The TAWS Forward Looking Terrain Avoidance (FLTA) and Premature Descent Alerts (PDA) functions may be inhibited to stop alerting for acceptable flight conditions. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

To Inhibit TAWS:

1. Display the MAP – TAWS page
2. INHIBIT Softkey ..... PRESS
3. Verify a TAWS INH annunciation displays on both PFDs and in the lower right corner of the MFD.

To Enable TAWS If Inhibited:

1. Display the MAP – TAWS page
2. ENABLE Softkey ..... PRESS
3. Verify the TAWS INH annunciations displays are removed both PFDs and the MFD.

TAWS N/A and TAWS FAIL TAWS N/A TAWS FAIL

1. If the amber TAWS N/A status annunciator is displayed on the PFDs and MFD, the system will no longer provide TAWS alerting or display relative terrain and obstacle elevations. The crew must maintain compliance with procedures that ensure minimum terrain and obstacle separation.
2. If the amber TAWS FAIL status annunciator is displayed on the PFDs and MFD, the system will no longer provide TAWS alerting or display relative terrain and obstacle elevations. The crew must maintain compliance with procedures that ensure minimum terrain and obstacle separation.

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Section 4 - Normal Procedures

Table of Contents

COM RADIO COMMUNICATIONS BEFORE STARTING ENGINES 63

BEFORE STARTING 63

BEFORE TAXI 63

TAXI 64

BEFORE TAKEOFF (RUN-UP) 65

BEFORE TAKEOFF (FINAL ITEMS) 66

ON TAKEOFF ROLL 66

CLIMB, CRUISE, AND DESCENT 66

ICING CONDITIONS 66

SHUTDOWN AND SECURING 67

OTHER PROCEDURES 67

AUTOPILOT OPERATION 67

VERTICAL MODES 67

VERTICAL SPEED (VS) MODE: 67

FLIGHT LEVEL CHANGE (FLC) MODE: 68

ALTITUDE HOLD (ALT) MODE, MANUAL CAPTURE: 68

VERTICAL NAVIGATION (VNAV) 68

LATERAL MODES 69

NAVIGATION (VOR) 69

NAVIGATION (GPS DIRECT TO) 70

NAVIGATION (GPS OBS MODE) 70

APPROACHES 71

ILS 71

ILS GLIDE SLOPE INOPERATIVE 72

RNAV (GPS) (LPV or LNAV/VNAV) 74

RNAV (GPS) (LNAV, LNAV + V) 75
VOR APPROACH 76
BACK COURSE (BC) 78
GO AROUND (GA) 79
AUTOPILOT COUPLED GO AROUND (GA) (ESP Equipped Airplanes Only) 80
SYNTHETIC VISION 82

COM RADIO COMMUNICATIONS BEFORE STARTING ENGINES

To obtain an ATC clearance before starting the engines:

1. BAT Switch (Master Switch) ..... ON
2. Avionics Master Pwr Switch ..... ON

Use Pilot's Audio Panel and Com 1 to Obtain ATC Clearance, then:

3. Avionics Master Pwr Switch ..... OFF
4. BAT Switch (Master Switch) ..... OFF

BEFORE STARTING

These procedures should be conducted after completing the airplane's AFM BEFORE ENGINE STARTING checklist items.

1. Standby Battery Switch ..... PUSH
   [ON] illuminated if Aircraft Battery is OFF,
   [ARM] illuminated if Aircraft Battery is ON
2. Standby Attitude Gyro Fail Flag ..... NOT DISPLAYED
   (listen for standby altimeter vibrator operation)
3. Database ..... REVIEW FOR VALID OPERATING DATES AND CYCLE NUMBER
4. ENT key on the MFD Control Panel ..... PRESS to acknowledge the G1000 database information and activate the selected pilot profile.
5. AUX –Weight Planning ..... INPUT LOAD DATA

BEFORE TAXI

These procedures should be conducted during the airplane's AFM BEFORE TAXI checklist items, after the Avionics Master has been turned ON.

NOTE

Autopilot preflight test will not begin until both AHRS have aligned. Autopilot Pre-Flight test begins when the white PFT message is displayed on each PFD. Autopilot Pre-Flight test has successfully completed when the white PFT message extinguishes and the autopilot disconnect tone sounds.

CAUTION

A red PFT or AFCS annunciator indicates a malfunction within the autopilot system. The autopilot, yaw damper, and electric elevator trim will be inoperative.

1. Automatic Autopilot Preflight Test ..... COMPLETE
   a. Red AFCS Annunciator ..... ILLUMINATED WHILE AHRS ALIGNS
   b. Red AFCS Annunciator ..... EXTINGUISHES When Autopilot Preflight Test Begins

c. White PFT Annunciator.....ILLUMINATED (~ 5 Seconds)

d. White PFT Annunciator..... EXTINGUISHES when preflight test complete

e. Autopilot Disconnect Tone.....SOUNDS

2. Standby Attitude Indicator..... CHECK

a. PULL TO CAGE Knob .....PULL KNOB TO ERECT GYRO

b. Instrument Fail Flag ..... NOT DISPLAYED IN INSTRUMENT FACE

c. PFD1, PFD2, and Standby Attitude Indicator ..... COMPARE and CROSS CHECK

3. Altimeters ..... SET and CROSS CHECK
PFD 1, PFD 2, Standby Altimeter

If barometric pressure settings on the PFD1 and PFD2 altimeters differ by more than 0.03 in-Hg (1 HPa), the baro display on both PFDs will be amber.

TAXI

The following procedure should be accomplished while the aircraft is taxiing and prior to conducting the airplane's AFM BEFORE TAKEOFF (RUNUP) checklist.

NOTE

Taxiing the aircraft before a valid GPS position has been acquired can cause attitude and/or heading display to indicate a failed condition. Interference from GPS repeaters or magnetic anomalies can cause an intermittent loss of attitude and heading displays while the aircraft in on the ground.

1. Flight Instruments..... CHECK

a. Compare attitude displayed by PFD1, PFD2, and Standby Attitude Indicator

b. Compare altitude displayed by PFD1, PFD2, and Standby Altimeter

c. Verify the correct barometric pressure is set in the PFD1, PFD2, and Standby Altimeters

d. Compare heading displayed by PFD1, PFD2, and Magnetic Compass

NOTE

The standby compass is erratic when windshield anti-ice, air conditioner, or electric heat is ON. Windshield anti-ice, air conditioner, and electric heat must be OFF for heading verification check.

e. Verify turn rate and slip indicator display appropriately.

BEFORE TAKEOFF (RUN-UP)

These procedures supersede the same procedures in the airplane's AFM BEFORE TAKEOFF (RUNUP) checklist.

1. Autopilot ..... CHECK, THEN OFF
   a. PUSH the AP Button on the Mode Control Panel.....VERIFY Autopilot Engages
   b. Verify ROL / AP YD / PIT annunciated in green on the PFDs
   c. Control Wheel PULL FULL AFT .....VERIFY Elevator Tab Wheel moves in the DN direction
   d. Control Wheel, PUSH FULL FORWARD.....VERIFY Elevator Tab Wheel moves in the UP direction
   e. Pilot's Control Wheel, AP/YD DISC / TRIM INTRPT Button, PRESS ..... VERIFY Autopilot Disconnects
      - Autopilot Disconnect Tone Sounds
      - Amber AP and YD flashes for 5 seconds and then extinguishes
      - Servos disengaged
   f. PUSH the AP Button on the Mode Control Panel.....VERIFY Autopilot Engages
   g. Copilot's Control Wheel, AP/YD DISC / TRIM INTRPT Button, PRESS ..... VERIFY Autopilot Disconnects
   h. Manually Operate Elevator Tab Wheel.....VERIFY Pitch Trim Servo is Not Engaged

2. Electric Elevator Trim Control ..... CHECK
   a. Pilot's Control Wheel
      - Left and Right Segments ..... ACTUATE INDIVIDUALLY (Verify there is no elevator tab wheel movement)
      - Left and Right Segments ..... ACTUATE TOGETHER (Verify proper elevator tab wheel movement)
      - With Elevator Tab Wheel in Motion, AP/YD DISC / TRIM INTRPT Button ..... PRESS AND HOLD (verify elevator tab wheel motion stops)
      - Manually Operate Elevator Tab Wheel..... VERIFY Pitch Trim Servo is Not Engaged

   b. Copilot's Control Wheel (If Installed)
      - Left and Right Segments ..... ACTUATE INDIVIDUALLY (Verify there is no elevator tab wheel movement)
      - Left and Right Segments ..... ACTUATE TOGETHER (Verify proper elevator tab wheel movement)
      - With Elevator Tab Wheel in Motion, AP/YD DISC / TRIM INTRPT Button ..... PRESS AND HOLD (verify elevator tab wheel motion stops)

- Pilot's Trim Override..... CHECK

  Activate the copilot's Pitch Trim Switches nose down. Verify elevator tab wheel is moving nose down. While the tab wheel is moving in the DN direction, activate the pilot's Pitch Trim Switches nose up. Verify the elevator tab wheel begins to move in the UP direction. Release both pilot's and copilot's Pitch Trim switches and reset elevator tab as required.

- Manually Operate Elevator Tab Wheel..... VERIFY Pitch Trim Servo is Not Engaged

3. Press GA Button on Left Power lever ..... VERIFY FD Command Bars show Takeoff Attitude
   'TO / / TO' is Annunciated in Mode Window on Both PFDs

BEFORE TAKEOFF (FINAL ITEMS)

These procedures should be conducted after completing the airplane's AFM BEFORE TAKEOFF (FINAL ITEMS) checklist.

1. PFD Attitude and Heading .....NORMAL
2. GPS Position..... VALID, 'LOI' NOT ANNUNCIATED on HSI
3. Standby Attitude Indicator..... ERECT and NORMAL, Fail Flag not in view

ON TAKEOFF ROLL

This procedure should be conducted after brake release during the takeoff roll but before becoming airborne.

1. Verify correspondence of PFD airspeed display and standby airspeed

CLIMB, CRUISE, AND DESCENT

Disengage autopilot and yaw damper and retrim the airplane in roll and yaw following a power change, change in airspeed, or if a slight wing rocking is observed. Re-engage the autopilot and yaw damper after trimming the airplane.

ICING CONDITIONS

WARNING

DUE TO DISTORTION OF THE WING AIRFOIL, ICE ACCUMULATION ON THE LEADING EDGES CAN CAUSE A SIGNIFICANT LOSS IN RATE OF CLIMB AND IN SPEED PERFORMANCE, AS WELL AS INCREASES IN STALL SPEED. EVEN AFTER CYCLING THE DEICE BOOTS, THE ICE ACCUMULATION REMAINING ON THE BOOTS AND UNPROTECTED AREAS OF THE AIRPLANE CAN CAUSE LARGE PERFORMANCE LOSSES. FOR THE SAME REASON, THE AURAL STALL WARNING SYSTEM MAY NOT BE ACCURATE AND SHOULD NOT BE RELIED UPON. UNDER THESE CONDITIONS, ESP AND AUTOPILOT UNDERSPEED PROTECTION MAY ALSO NOT BE ACCURATE AND SHOULD NOT BE RELIED UPON.

SHUTDOWN AND SECURING

These procedures should be conducted after the Battery and Generator Switches have been turned OFF in the AFM SHUTDOWN AND SECURING checklist, and before the flight crew vacates the cockpit.

1. Standby Battery Switch.....PRESS OFF
   a. Standby Battery Switch..... [ARMED] and [ON] EXTINGUISHED
   b. Standby attitude fail flag displayed after BAT – MASTER SWITCH is OFF
   c. Standby altimeter vibrator should not be heard (BAT – MASTER SWITCH OFF)

OTHER PROCEDURES

AUTOPILOT OPERATION

Autopilot/Flight Director mode annunciations on the PFDs displayed in green indicate active autopilot/flight director modes. Annunciations displayed in white indicate armed autopilot/flight director modes. Normal mode transitions will flash inverse video green/black for 10 seconds before becoming steady green. Abnormal mode transitions will flash amber for 10 seconds before the default mode is annunciated as the active mode.

Default autopilot/flight director modes are Pitch (PIT) and Roll (ROL) modes.

The XFR button on the mode control panel selects the navigation, attitude, and air data inputs the autopilot / flight director uses. Pressing the XFR button transfers these selections to the opposite side and causes the autopilot / flight director to drop selected lateral and vertical modes and engage the default PIT and ROL modes. The pilot must re-select the desired modes.

VERTICAL MODES

VERTICAL SPEED (VS) MODE:

1. Altitude Preselect.....SET to Desired Altitude
2. Press VS Button .....GREEN ‘VS’, White ‘ALTS’ annunciated on PFD
3. Vertical Speed Reference.....ADJUST using UP / DN Wheel
4. Green ‘ALT; .....VERIFY UPON ALTITUDE CAPTURE

FLIGHT LEVEL CHANGE (FLC) MODE:

1. Altitude Preselect.....SET to Desired Altitude
2. Press FLC Button .....GREEN 'FLC', White 'ALTS' annunciated on PFD
3. AIRSPEED Reference.....ADJUST using UP / DN Wheel
4. Green 'ALT; .....VERIFY UPON ALTITUDE CAPTURE

NOTE

If the altitude preselect is not changed before selecting FLC, the autopilot may re-capture the current altitude immediately after entering FLC mode. Always ensure that the altitude preselect is adjusted prior to selecting FLC.

Pressing the SPD button while in FLC Mode toggles the airspeed reference between KIAS and Mach. FLC will automatically transition from Mach to KIAS reference during a descent when the current Mach reference equals 220 KIAS. FLC will not automatically transition from KIAS to a Mach reference during a climb.

ALTITUDE HOLD (ALT) MODE, MANUAL CAPTURE:

1. At the desired altitude.....PRESS ALT Button on Mode Controller
2. Green 'ALT'.....VERIFY on PFD

If climbing or descending, the aircraft will overshoot the reference altitude and then return to it. The amount of overshoot will depend on the vertical speed when the ALT button is pressed.

VERTICAL NAVIGATION (VNAV)

VNAV Descent

Vertical navigation will only function when the navigation source is GPS navigation. VNAV will not function if the navigation source is VOR, Localizer, or ADF. The airplane's heading must be within 75° of the desired GPS course and within 10 NM cross track error in order of VNAV to function.

VNAV functions only for enroute and terminal descents. Vertical navigation is not available during climbs or descents between the final approach fix (FAF) and the missed approach point (MAP). Refer to the G1000 Cockpit Reference Guide and Pilot's Guide for additional information.

1. Once clearance from ATC has been received .....RESET Altitude Preselect to the vertical clearance limit.
2. VNV Button.....PRESS within 5 minutes of the top of descent (TOD)

NOTE

If the VNV button is pressed more than 5 minutes before the TOD or the altitude preselect is not reset to a lower altitude, VPTH will begin to flash inverse video, white/black, when the aural alert 'Vertical Track' annunciation sounds.

Pressing the VNV button and/or resetting the altitude preselect to a lower altitude cancels the flashing and the AFCS will capture and track the vertical profile.

If VNV button is not pressed, or the altitude preselect is not reset to a lower altitude, VPTH stops flashing at the TOD and the airplane will remain in ALT mode and not descend.

ALTV will be the armed vertical mode during the descent if the altitude preselect is set to a lower altitude than the VNAV reference altitude. This indicates the autopilot / flight director will capture the VNAV altitude reference. ALTS will be the armed mode during the descent if the altitude preselect is set at or above the VNAV reference altitude indicating that the autopilot / flight director will capture the altitude preselect altitude reference.

Vertical DIRECT TO

To descend from the present position to a waypoint:

1. Altitude Preselect..... RESET
2. VNV Button..... PRESS
3. Waypoint..... SELECT desired waypoint
4. VNV ~~D~~> Softkey (MFD Flight Plan Page)..... PRESS
5. Vertical DIRECT TO ..... ACTIVATE

LATERAL MODES

HEADING MODE (HDG)

1. HDG Knob ..... PUSH to synch heading bug to current heading
2. HDG BUTTON..... PUSH , HDG mode annunciated
3. HDG Knob ..... Rotate to set heading bug to desired heading

NAVIGATION (VOR)

1. Navigation Source. ..... SELECT VOR1 or VOR2 using CDI softkey on PFD
2. Course Pointer..... SET using CRS knob
3. Intercept Heading ..... ESTABLISH in HDG or ROL mode
4. Mode Controller ..... PRESS NAV on mode controller
5. VOR will be annunciated in WHITE if the mode is armed or in GREEN if the VOR is the active lateral mode.

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate VOR in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate VOR in green on the PFD.

NAVIGATION (GPS DIRECT TO)

1. Navigation Source ..... SELECT GPS Using the CDI Softkey on PFD
2. Select Waypoint.....PRESS the ~~D~~> button on the PFDs or MFD
   From the DIRECT TO page, activate DIRECT TO a waypoint.
3. Mode Controller .....SELECT NAV on mode controller
   GPS will be annunciated in GREEN on the PFDs

NAVIGATION (GPS OBS MODE)

1. Navigation Source .....SELECT GPS using the CDI softkey on PFD
2. Select Waypoint.....PRESS the ~~D~~> button on the PFDs or MFD
   From the DIRECT TO page, activate DIRECT TO a waypoint.
3. OBS Softkey .....ON PFD, PRESS OBS softkey
4. Course Pointer.....SET using CRS knob
5. Intercept Heading .....ESTABLISH in HDG or ROL mode
6. Mode Controller .....SELECT NAV on mode controller
7. GPS will be annunciated in WHITE if the mode is armed or in GREEN if the GPS is the active lateral mode.

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate GPS in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate GPS in green on the PFD.

APPROACHES

The G1000 is capable of performing many tasks for the pilot to reduce pilot workload during the approach and landing phases of flight. The G1000 system references the Flight Plan to predict the pilot's intended actions. Time permitting, the pilot should keep the Flight Plan updated with the destination airport and the instrument approach to be flown. This will keep the G1000 from performing tasks associated with the approach procedures entered in the flight plan if the approach plan changes.

ILS

1. Load the approach into the Active Flight Plan ..... VERIFY the G1000 tunes the proper ILS frequency
2. Approach Minimums ..... SET on TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel ..... PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD ..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... VERIFY CDI automatically changes to LOC Course pointer slews to the front course
   d. Mode Control Panel ..... PRESS APR, Verify LOC and GS armed

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF
   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Control Panel ..... PRESS NAV (GPS Mode)
   d. Mode Control Panel ..... PRESS APR, Verify LOC and GS armed

NOTE

Airplane will navigate in GPS mode throughout the intermediate portion of the approach procedure. When the airplane is inbound towards the final approach course, the CDI will automatically switch from GPS navigation to LOC navigation.

   e. VERIFY ..... Course pointer slews to the front course

4. Established inbound on Final Approach Course ..... SET Missed Approach Altitude In Altitude Preselect
5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. VERIFY.....Airplane Captures and Tracks LOC, captures and tracks GS
7. AT Decision Altitude (DA),
   a. A/P Y/D DISC TRIM INTRPT Switch ..... PRESS
      Continue visually for a normal landing

      Or

   b. GO AROUND button
      (on left power lever) ..... PRESS, Execute Missed Approach Procedure

ILS GLIDE SLOPE INOPERATIVE

1. Load the approach into the Active Flight Plan..... VERIFY the G1000 tunes the proper ILS frequency
2. Approach Minimums..... SET on TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD.....SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... VERIFY CDI automatically changes to LOC
      Course pointer slews to the front course
   d. Mode Control Panel ..... PRESS NAV, verify LOC armed

      Pressing the NAV button will arm the autopilot / flight director to capture Localizer and prevent Glideslope from arming or capturing if the glideslope is inoperative or out of service

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS Nav Source

   c. Mode Control Panel ..... PRESS NAV (GPS Mode)

NOTE

Airplane will navigate in GPS mode throughout the intermediate portion of the approach procedure. When the airplane is inbound towards the final approach course, the CDI will automatically switch from GPS/SBAS navigation to LOC navigation.

   d. VERIFY ..... Course pointer slews to the front course

4. Established inbound on Final Approach Course (FAF Active Waypoint)

   a. VERIFY ..... Course Pointer is set to the final approach course

   b. VERIFY ..... LOC is annunciated on the HSI

5. Airspeed..... MAINTAIN 110 KIAS OR GREATER (Recommended)

6. At the FAF..... Use desired vertical mode to fly the approach's vertical profile
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

NOTE

It is Recommend descending at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. After Leveling at MDA..... SET Missed Approach Altitude In Altitude Preselect

RNAV (GPS) (LPV or LNAV/VNAV)

1. Load the approach into the Active Flight Plan
2. Approach Minimums.....SET ON TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD.....SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. VERIFY ..... Course pointer slews to the front course
   d. Mode Control Panel ..... PRESS APR, Verify GPS and GP armed

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF
   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Control Panel ..... PRESS APR, Verify GPS mode active, GP armed
   d. VERIFY ..... Course pointer slews to the front course
4. Established inbound on Final Approach Course
   a. VERIFY ..... Course Pointer is set to the final approach course
   b. VERIFY ..... LPV or L/VNAV is annunciated on the HSI
   c. VERIFY ..... GP Indicator Displays
   d. VERIFY ..... SUSP is not displayed on HSI
   e. SET .....Missed Approach Altitude In Altitude Preselect
5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. VERIFY..... Airplane Captures and Tracks GPS Course, Captures and tracks GP
7. AT Decision Altitude (DA),
   c. A/P Y/D DISC TRIM INTRPT Switch .....PRESS
      Continue visually for a normal landing

      Or

   d. GO AROUND button
      (on left power lever) ..... PRESS, Execute Missed Approach Procedure

RNAV (GPS) (LNAV, LNAV + V)

1. Load the approach into the Active Flight Plan
2. Approach Minimums.....SET ON TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD.....SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. VERIFY ..... Course pointer slews to the inbound course
   d. Mode Controller.....PRESS APR Button
      GPS will be the active lateral mode,
      GP will ARM if the procedure provides vertical guidance

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF
   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Controller.....PRESS APR Button
      GPS will be the active lateral mode,
      GP will ARM if the procedure provides vertical guidance

4. Established inbound on Final Approach Course (FAF Active Waypoint)
   a. VERIFY .....Course Pointer is set to the final approach course
   b. VERIFY .....LNAV+V or LNAV is annunciated on the HSI
   c. VERIFY ..... GP Deviation Scale Displays (if applicable)
   d. SET ..... Minimum Descent Altitude (MDA) Altitude In Altitude Preselect
5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)

NOTE

Some RNAV (GPS) approaches provide a vertical descent angle as an aid in flying a stabilized approach. These approaches are NOT considered Approaches with Vertical Guidance (APV). Approaches that are annunciated on the HSI as LNAV or LNAV+V are considered Nonprecision Approaches (NPA) and are flown to an MDA even though vertical glidepath (GP) information may be provided.

6. At the FAF..... Descend via GP if LNAV+V approach
   Use desired vertical mode to fly the approach's vertical profile if LNAV approach
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

NOTE

It is recommend to descend at 1000 ft/min or less. Descending at a higher rate of descent or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

CAUTION

Airplane will not capture ALT if descending in GP mode.

7. Level airplane in ALT mode at MDA..... PRESS NAV button 200 ft above MDA

   If airplane is descending via GP, GP will extinguish and PIT mode will be active and airplane will capture MDA.

8. AFTER LEVELING AT MDA.....SET Missed Approach Altitude In Altitude Preselect

VOR APPROACH

1. Load the approach into the Active Flight Plan..... VERIFY the G1000 tunes the proper VOR frequency
2. Approach Minimums.....SET ON TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD.....SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI .....PRESS until VOR navigation source To be used for the approach displays
   d. Course Pointer .....Set to inbound course (if not already set)
   e. Mode Control Panel .....PRESS APR, verify VAPP armed

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS nav source

   c. Mode Control Panel ..... PRESS NAV (GPS mode)

   d. When Established Inbound to the FAF ..... PRESS CDI softkey until VOR navigation source to be used for the approach displays (Autopilot / Flight Director Mode will automatically change to ROL)

   e. Course Pointer ..... Set to inbound course

   f. Mode Control Panel ..... PRESS APR, verify VAPP active or armed

4. Established inbound on Final Approach Course

   a. VERIFY ..... Course Pointer is set to the inbound course

   b. VERIFY ..... VOR is annunciated on the HSI

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the VAPP mode and indicate VAPP in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the APR button is pressed and annunciate VAPP in green on the PFD.

5. Airspeed..... MAINTAIN 110 KIAS OR GREATER (Recommended)

6. At the FAF..... Use desired vertical mode to fly the approach's vertical profile
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

   It is recommend to descend at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. AFTER LEVELING AT MDA..... SET Missed Approach Altitude In Altitude Preselect

BACK COURSE (BC)

1. Load the approach into the Active Flight Plan ..... VERIFY the G1000 tunes the proper LOC frequency
2. Approach Minimums .....SET ON TMR/REF page (if not already set)

IF Flying Vectors-To-Final:

3. Airplane on Vectors-To-Final
   a. Mode Control Panel ..... PRESS HDG to fly radar vectors
   b. PROC button on PFDs or MFD.....SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... PRESS until LOC Navigation Source to be used for the Approach Displays
   d. VERIFY .....Course Pointer is Set to the Front Course
   e. Mode Control Panel .....PRESS BC, Verify BC mode is armed

IF Flying Full Approach Including Transition:

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS
   c. Mode Control Panel ..... PRESS NAV (GPS Mode)
   d. Pathways..... AS DESIRED
   e. When Established Inbound to the FAF ..... PRESS CDI softkey until LOC navigation source to be used for the approach displays (Autopilot / Flight Director Mode will automatically change to ROL)
   f. VERIFY ..... Course Pointer is set to the Front Course
   g. Mode Control Panel .....PRESS BC Verify BC mode is armed or active

4. Established inbound on Final Approach Course
   a. VERIFY ..... Course Pointer is set to the front course
   b. VERIFY ..... LOC is annunciated on the HSI

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the BC mode and indicate BC in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the APR button is pressed and annunciate BC in green on the PFD.

5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. At the FAF.....Use desired vertical mode to fly the approach's vertical profile
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

   It is recommend to descend at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. AFTER LEVELING AT MDA.....SET Missed Approach Altitude In Altitude Preselect

GO AROUND (GA)

1. Control Wheel..... GRASP FIRMLY
2. GO AROUND button (left power lever) .....PUSH – Verify GA / / GA on PFD in lateral and vertical mode fields
3. Rotate to Go Around attitude.....Follow Flight Director Command Bars
4. Balked Landing.....EXECUTE
5. Mode Control Panel.....PRESS NAV to Fly Published Missed Approach Procedure
   PRESS HDG to Fly ATC Assigned Missed Approach Heading

NOTE

The pilot is responsible for initial missed approach guidance in accordance with published procedure. The G1000 may not provide correct guidance until the aircraft is established on a defined leg of the procedure.

6. Altitude Preselect.....VERIFY Set to appropriate altitude

At an appropriate safe altitude:

7. Mode Control Panel.....AP to Engage Autopilot

NOTE

When the GA button is pressed, the autopilot disconnects, the Flight Director command bars will command 8^{O} nose up and wings level, the HSI nav source automatically switches to GPS, the flight plan sequences to the first published missed approach leg, and automatic leg sequencing resumes. The autopilot will disconnect if the ESP option is not installed. If ESP is installed, the autopilot will not disconnect with a GA button press. The AFCS will fly the published missed approach procedure once the aircraft is established on a segment of the missed approach procedure, the autopilot is engaged, and NAV mode is selected.

The flight plan can only contain one approach procedure at a time. If the pilot attempts to load another instrument approach at this time, the airplane will depart from the missed

approach procedure and turn directly towards the first waypoint in the new approach. Do not attempt to load or activate a new approach while flying the missed approach procedure until ready to fly the new approach.

Recommended procedures following a missed approach:

1. To repeat the instrument approach procedure currently loaded into the flight plan
    a. Activate Vectors-To-Final if being radar vectored by ATC,

    Or

    b. If flying the entire instrument approach procedure, activate a DIRECT TO the desired initial waypoint. Follow the appropriate procedure for the instrument approach being flown.

2. To proceed to an alternate airport. This procedure will allow the pilot to enter the route to the alternate before leaving the missed approach holding fix.
    a. Highlight the first enroute waypoint in the flight plan
    b. Begin entering waypoints in the desired route order. Do not attempt to load a new approach at this time.
    c. CLR all waypoints after the last waypoint in the route to the alternate and the currently loaded instrument approach header.
    d. When ready to proceed to the alternate, highlight the first enroute waypoint in the route to the alternate airport. ACTIVATE a DIRECT TO that waypoint.
    e. When enroute to the alternate, a new instrument approach can now be loaded into the flight plan.

AUTOPILOT COUPLED GO AROUND (GA) (ESP Equipped Airplanes Only)

1. Control Wheel ..... GRASP FIRMLY
2. GO AROUND button (left power lever) ..... PUSH – Verify GA / / GA on PFD in lateral and vertical mode fields, **autopilot will not disengage**.
3. Autopilot ..... VERIFY airplane pitches up following flight director command bars
4. Balked Landing ..... EXECUTE
5. Mode Control Panel ..... PRESS NAV to Fly Published Missed Approach Procedure
   PRESS HDG to Fly ATC Assigned Missed Approach Heading

NOTE

The pilot is responsible for initial missed approach guidance in accordance with published procedure. The G1000 may not provide correct guidance until the airplane is established on a defined leg of the procedure.

6. Altitude Preselect ..... VERIFY Set to appropriate altitude

NOTE

In ESP equipped airplanes, when the GA button is pressed the Flight Director command bars will command 8° nose up and wings level, the HSI nav source automatically switches to GPS, the flight plan sequences to the first published missed approach leg, and automatic leg sequencing resumes. The autopilot will remain engaged, and fly the published missed approach procedure once the airplane is established on a segment of the missed approach procedure and NAV mode is selected.

The flight plan can only contain one approach procedure at a time. If the pilot attempts to load another instrument approach at this time, the airplane will depart from the missed approach procedure and turn directly towards the first waypoint in the new approach. Do not attempt to load or activate a new approach while flying the missed approach procedure until ready to fly the new approach.

Recommended Procedures Following a Missed Approach:

1. To repeat the instrument approach procedure currently loaded into the flight plan:
    a. Activate Vectors-To-Final if being radar vectored by ATC,

    Or

    b. If flying the entire instrument approach procedure, activate a DIRECT TO the desired initial waypoint. Follow the appropriate procedure for the instrument approach being flown.

2. To proceed to an alternate airport (This procedure will allow the pilot to enter the route to the alternate before leaving the missed approach holding fix):
    a. Highlight the first enroute waypoint in the flight plan
    b. Begin entering waypoints in the desired route order. Do not attempt to load a new approach at this time.
    c. CLR all waypoints after the last waypoint in the route to the alternate and the currently loaded instrument approach header.
    d. When ready to proceed to the alternate, highlight the first enroute waypoint in the route to the alternate airport. ACTIVATE a DIRECT TO that waypoint.
    e. When enroute to the alternate, a new instrument approach may be loaded into the flight plan.

SYNTHETIC VISION

Use of Pathways

If Synthetic Terrain is displayed on the PFD, the Pathways may be used to assist the pilot's awareness of the programmed lateral and vertical navigation path. The following sections describe the basic use of the Pathways in various flight segments. For more detailed information, consult the G1000 Pilot's Guide.

Departure

Prior to departure, load and activate the desired flight plan into the G1000 FMS, set the initial altitude on the G1000 altitude selector and select GPS on the HSI display just as you would without the SVS system.

The programmed flight path will be displayed as a series of magenta boxes along the path at the flight plan altitude subject to the following conditions;

- If the first segment of the flight plan is a heading to altitude leg, the Pathway will not be displayed for that segment. The first Pathway segment displayed will be the first GPS course leg.
- The Pathway must be within the SVS field of view of 30 degrees left and 35 degrees right. If the programmed path is outside that field of view, the Pathways will not be visible on the display until the aircraft has turned toward the course.
- The Pathway will be displayed at either the altitude selected on the G1000 selector OR the altitude published for the procedure (e.g. SID) WHICHEVER IS HIGHER.

After departure, the primary aircraft control must be by reference to the primary aircraft instruments. The SVS and Pathway displays should be used to aid in awareness of the terrain and programmed flight path.

Prior to intercepting the programmed course, the Pathway will be displayed as a series of magenta "boxes" with pointers at each corner that point in the direction of the programmed course. The Pathway boxes will not be displayed on portions of the course line that would lead the pilot to intercept the course in the wrong direction.

As the aircraft approaches the center of the programmed course and altitude, the number of Pathway boxes will decrease to a minimum of four.

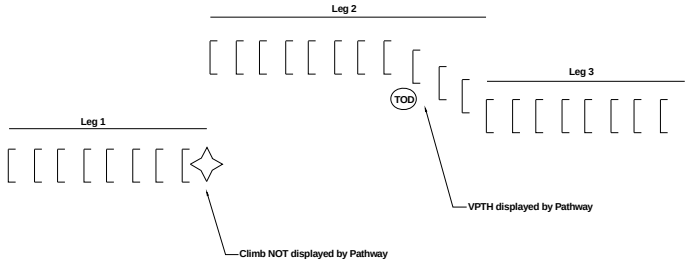
Enroute

When enroute, the Pathway will be displayed along the lateral path defined by the flight plan, at the altitude selected on the G1000 altitude selector.

Flight plan changes in altitude that require a climb will be indicated by the Pathway being displayed as a level path at the altitude entered for the current flight plan leg. Because the G1000 system does not have information available to it about aircraft performance, climb profiles are not displayed by the Pathway.

If the programmed flight plan includes one or more defined VNAV descent segments, the descent path(s) will be displayed by the Pathway as prompted by the G1000 FMS.

If the flight plan includes a significant change in course at a waypoint, the Pathway boxes toward the currently active waypoint will be magenta in color. The boxes defining the next flight plan segment may be visible, but will be displayed in a white color.



Enroute Pathway Altitude Display

Approach

During an approach transition with the GPS CDI active, the Pathway will be displayed along the lateral path defined by the flight plan, at the altitude selected on the G1000 altitude selector. Pathway will be displayed at least up to the Final Approach Fix on all instrument approach procedures.

For ILS, LNAV/VNAV, LNAV+V and LPV approaches, the Pathway will display the lateral and vertical descent segments from the glideslope or glidepath intercept altitude, down to the Decision Altitude. For all other non-precision approaches, Pathway will not display beyond the Final Approach Fix until the missed approach segment become active.

In all cases, the pilot must still ensure that the aircraft complies with the requirements of the published instrument approach procedure.

Missed approach

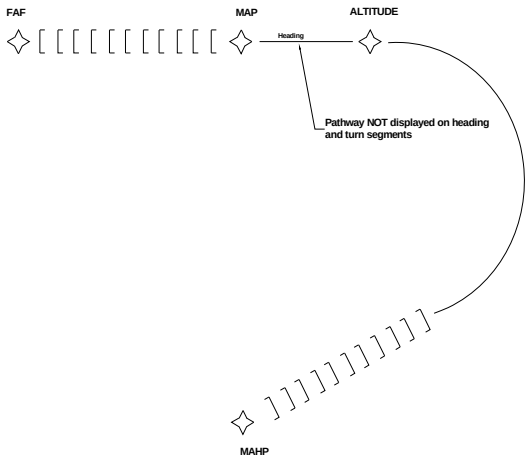
When the missed approach is selected on the G1000 FMS, the Pathway to the Missed Approach Holding Point will be displayed just as described for the departure segment.

The pilot must assure that the aircraft path will, at all times, comply with the requirements of the published missed approach procedure.

If the initial missed approach leg is heading-to-altitude or a leg defined by other than a GPS course, the Pathway will not be displayed for that segment.

If the course to the Missed Approach Holding Point is out of the SVS field of view during the initial missed approach climb, the Pathway will not be visible on the PFD until the aircraft is turned toward the course.

The Pathway will be displayed at the published missed approach altitude OR the altitude set on the G1000 altitude selector WHICHEVER IS HIGHER. If the G1000 altitude selector is set to MDA on the final approach segment and not reset during the initial missed approach, the Pathway will still be displayed at the published missed approach altitude.



Missed Approach Pathway Display

Section 5 - Performance

No Change. Refer to basic Aircraft Flight Manual or appropriate supplement.

Section 6 - Weight and Balance

No Change. Refer to basic Aircraft Flight Manual or appropriate supplement

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Section 7 - Systems Description

Table of contents

GENERAL 88

G1000 INTEGRATED AVIONICS 88

SYSTEM OVERVIEW 88

INSTRUMENT PANEL 88

FLIGHT CONTROLS 103

AFCS, AUTOPILOT AND FLIGHT DIRECTOR 103

ELECTRIC ELEVATOR TRIM 106

ELECTRONIC STABILITY & PROTECTION (ESP) 107

FLIGHT INSTRUMENTS 110

G1000 FLIGHT INSTRUMENTS 110

STANDBY FLIGHT INSTRUMENTS 110

ENGINE INSTRUMENTATION 111

PROPELLER SYNCHROPHASER 112

ELECTRICAL SYSTEM 112

INVERTERS 112

POWER DISTRIBUTION 112

STANDBY BATTERY POWER SUPPLY 117

LIGHTING SYSTEMS 118

COCKPIT 118

PITOT AND STATIC SYSTEM 119

PITOT 119

STATIC 119

GROUND COMMUNICATIONS 119

SYNTHETIC VISION 120

GENERAL

This section supplements the Systems Description chapter in the airplanes original Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. This section will follow the format and layout of the chapter in the original manual. Only topics changed by the installation of the G1000 integrated avionics system will be addressed in this supplement.

The G1000 system is an integrated system that presents flight instrumentation, navigation, communication, weather avoidance, engine instrumentation, and supplemental flight information to the pilot for enhanced situational awareness through large-format displays. The G1000 also incorporates an automatic flight control system that includes autopilot and flight director functions. Refer to the Garmin Pilot's Guide and Cockpit Reference Guide, P/N 190-00663-02 and 190-00664-02 Rev. A or later FAA approved revision for detailed descriptions of the Garmin G1000 system including its components, detailed descriptions of functions, and operating instructions.

G1000 INTEGRATED AVIONICS

SYSTEM OVERVIEW

The main components of the G1000 Integrated Avionics system consists of 14 Line Replaceable Units (LRU)s. Seven of those LRUs are mounted in the cockpit and interface the pilot to the G1000 system. There are two Primary Flight Displays (PFDs) that display primary flight information to the pilot such as attitude, airspeed, altitude, heading, vertical speed, navigation information, system information, and pilot situational awareness information. In the center of the cockpit, a 15 inch Multi-Function Display (MFD) displays engine gauges, flight plan data, various map displays, and access to aviation and weather information. Information access and data entry through the MFD is via the GCU 475 MFD controller mounted in the pedestal between the pilot's seats.

Communications is interfaced through the PFD's and two audio panels mounted outside each PFD. Radio tuning is through the PFDs and audio from the Com radios, Nav radios, ADF, intercom, and XM music is controlled by the two audio panels.

The G1000 incorporates a fully digital integrated autopilot and flight director. Pilot interface to the AFCS is through the GMC 710 Autopilot Mode controller mounted in the center of the cockpit just below the airplane's glareshield.

In addition to dual Primary Flight Displays, the system incorporates dual Air Data Computers (GDC), Dual AHRS (GRS), and Dual Integrated Avionics (GIA) units for system redundancy. Each GIA contains a VHF COM radio, a VHF NAV radio, Glide Slope receiver, Marker Beacon receiver, and a SBAS augmented GPS receiver.

Finally, the G1000 system includes weather radar and satellite downlinked weather information for weather avoidance and situational awareness.

INSTRUMENT PANEL

The G1000 Instrument Panel consists of two 10 inch LCD Primary Flight Displays, one 15 inch LCD Multi-Function Display, two audio panels, and autopilot / flight director mode control panel, an MFD controller, and three 2 ¼ inch standby instruments. The ADF control head has been relocated from the radio stack location on the instrument panel to the pedestal.

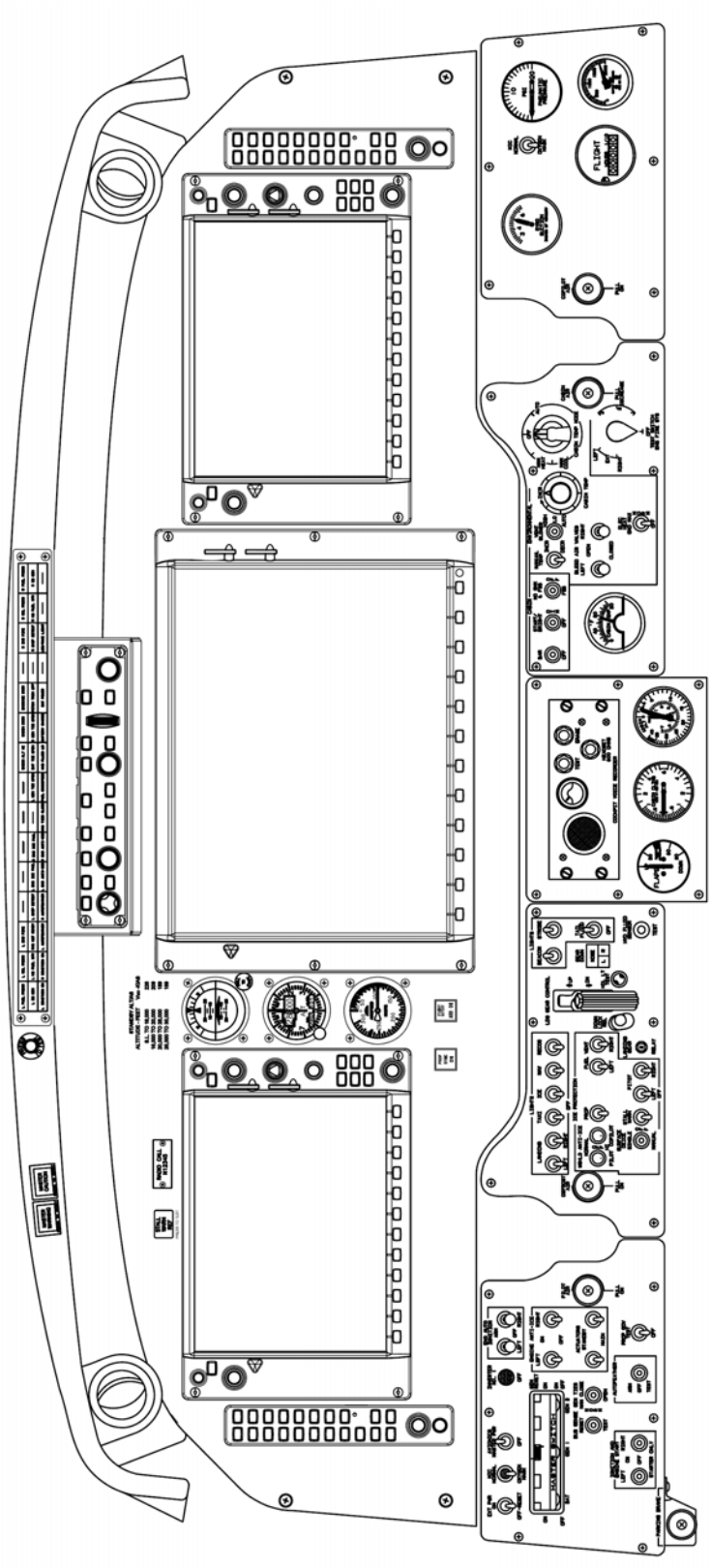


Figure 1, Instrument Panel

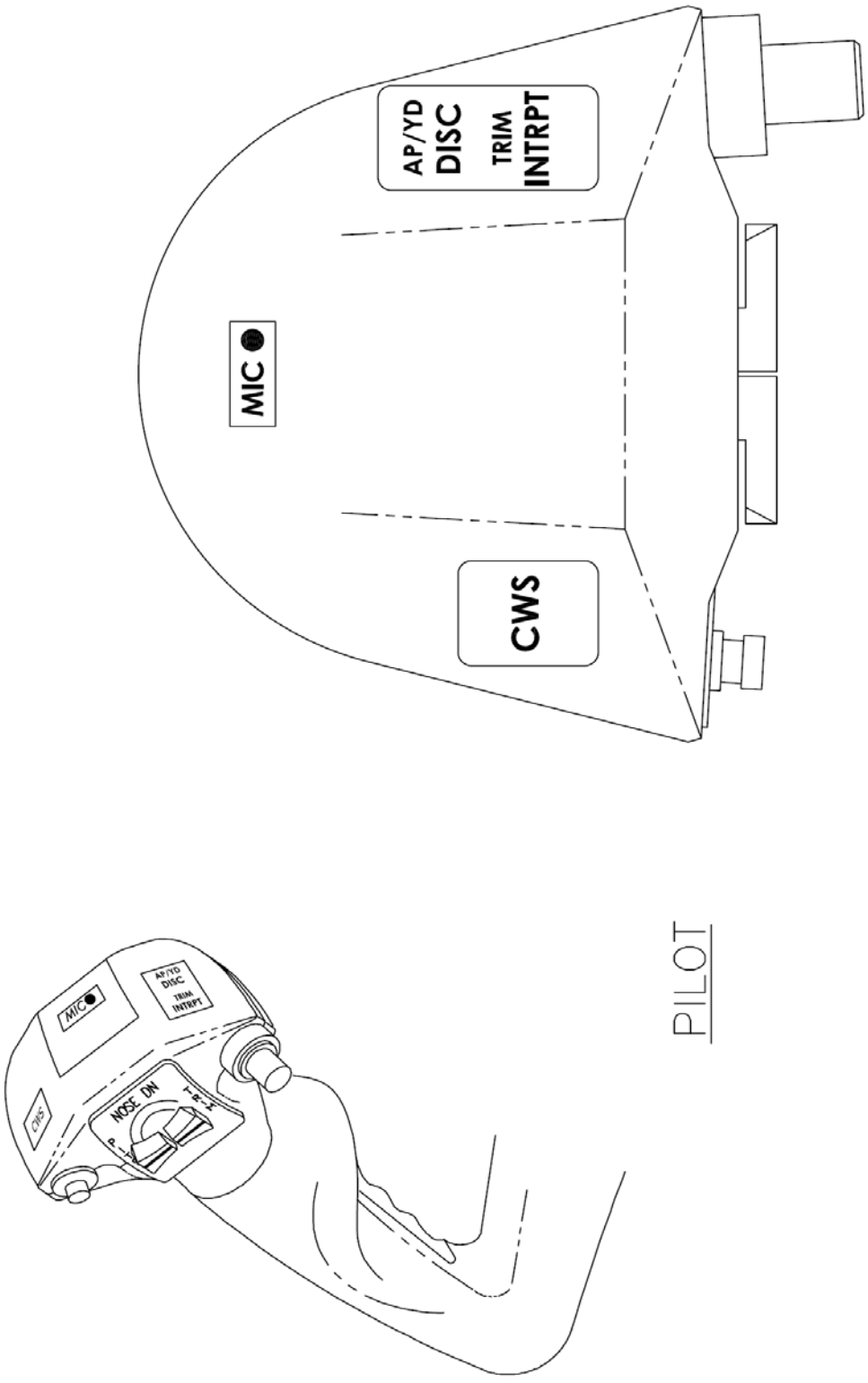


Figure 2, Pilot's Control Wheel

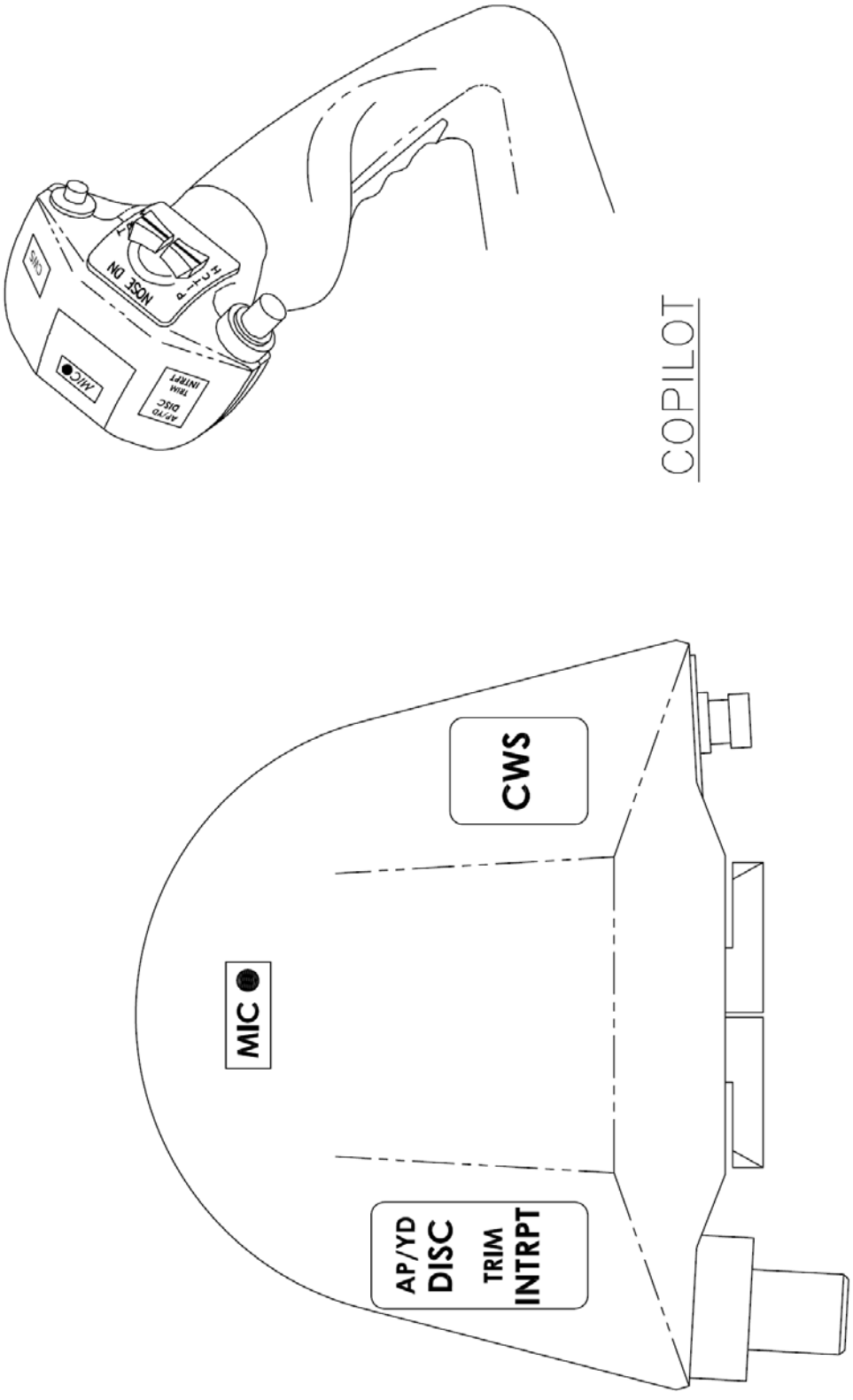


Figure 3, Copilot's Control Wheel With Trim Switches

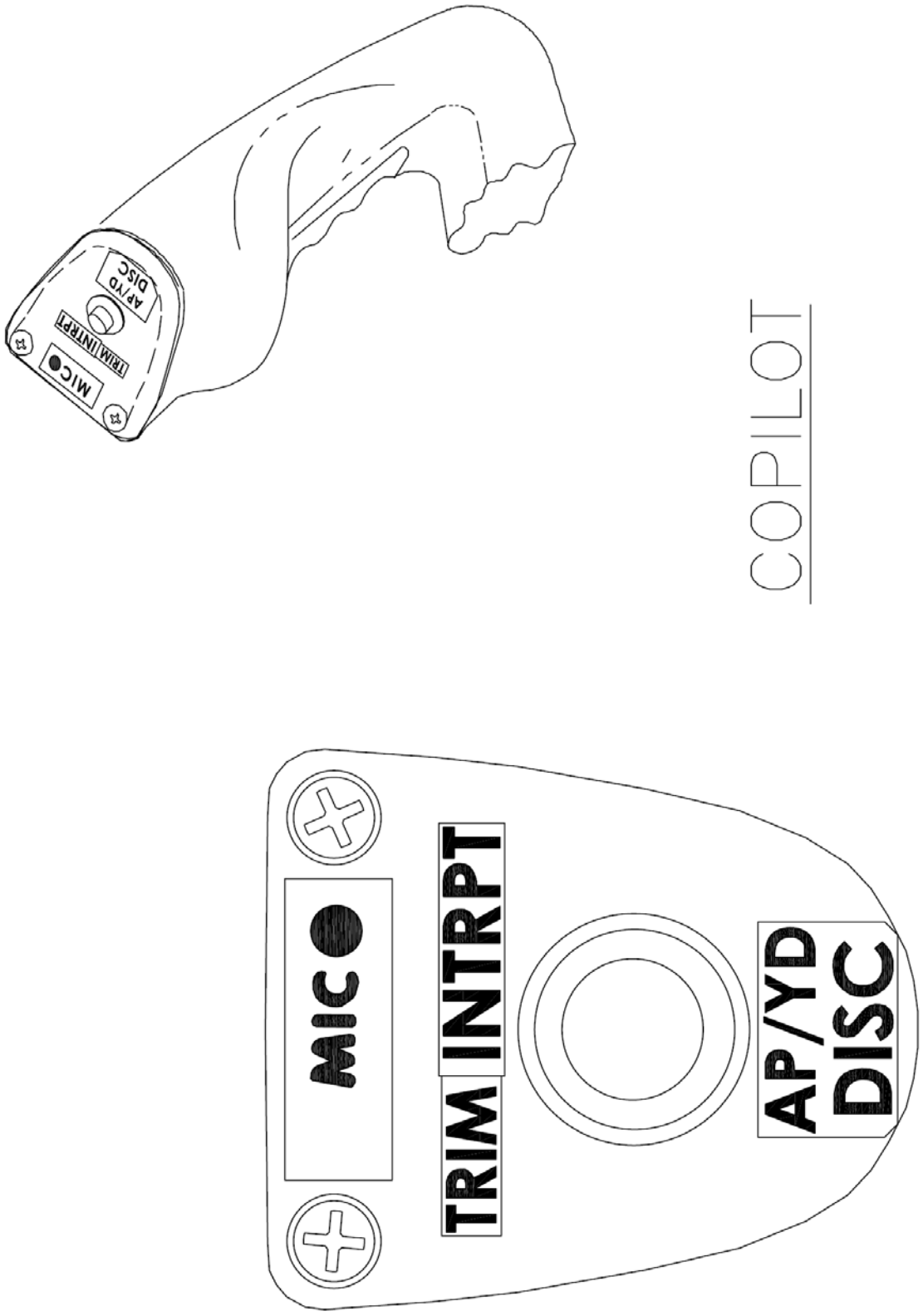


Figure 4, Copilot's Control Wheel Without Trim Switches

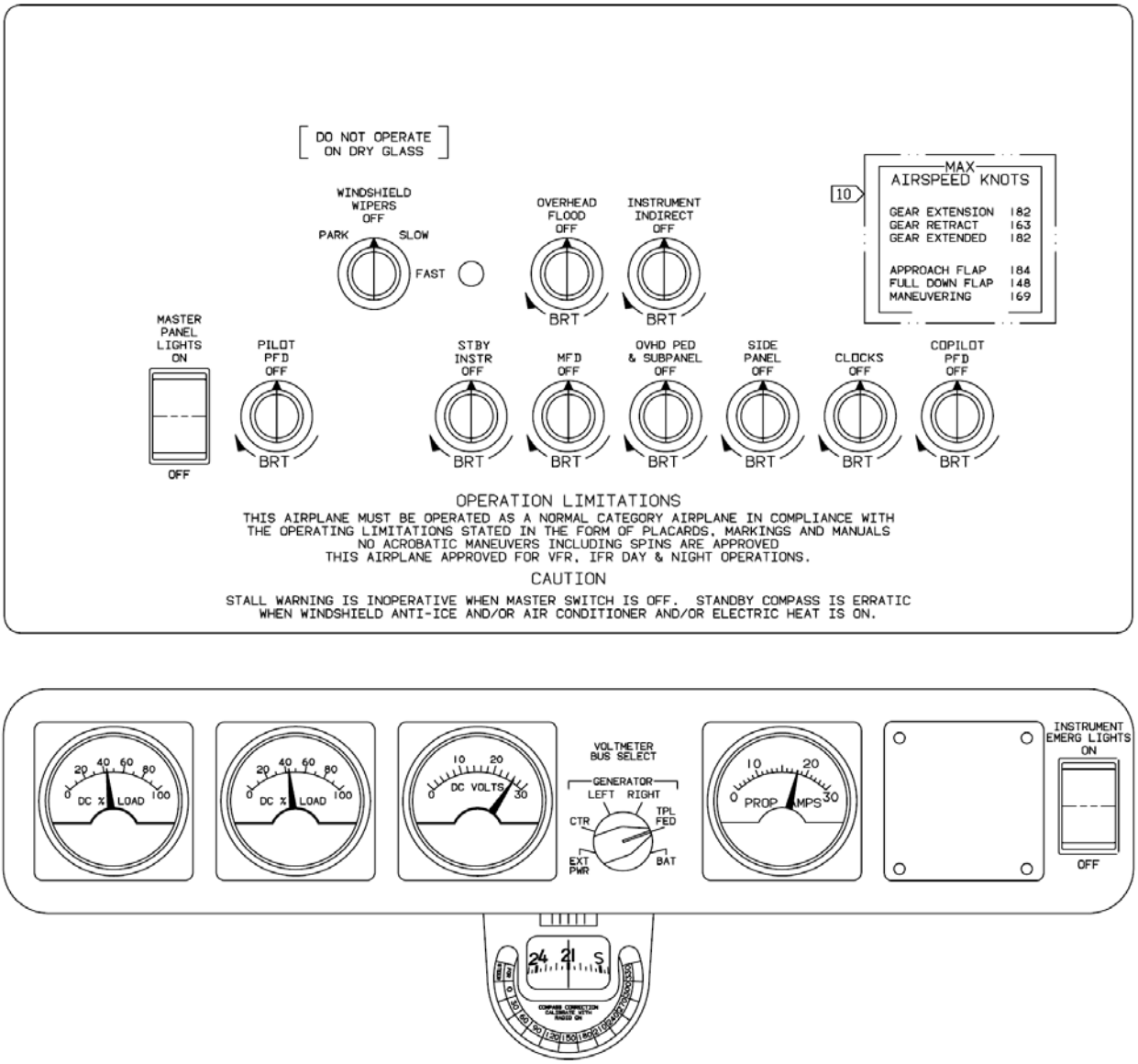


Figure 5, Overhead Light Control Panel

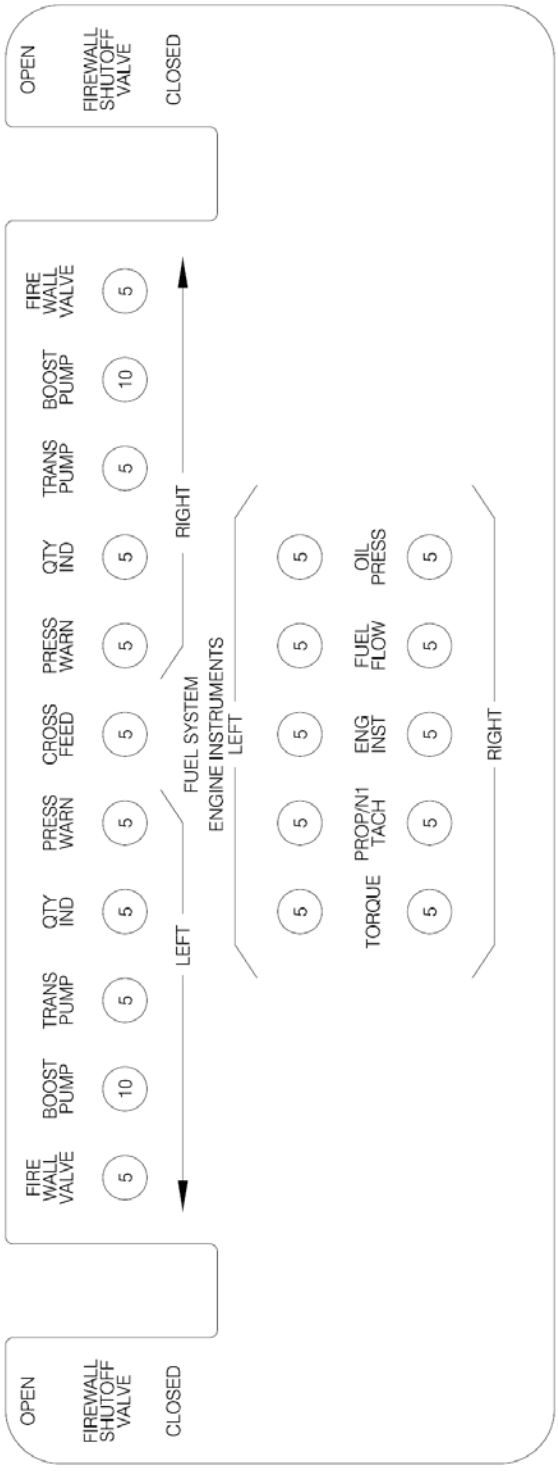
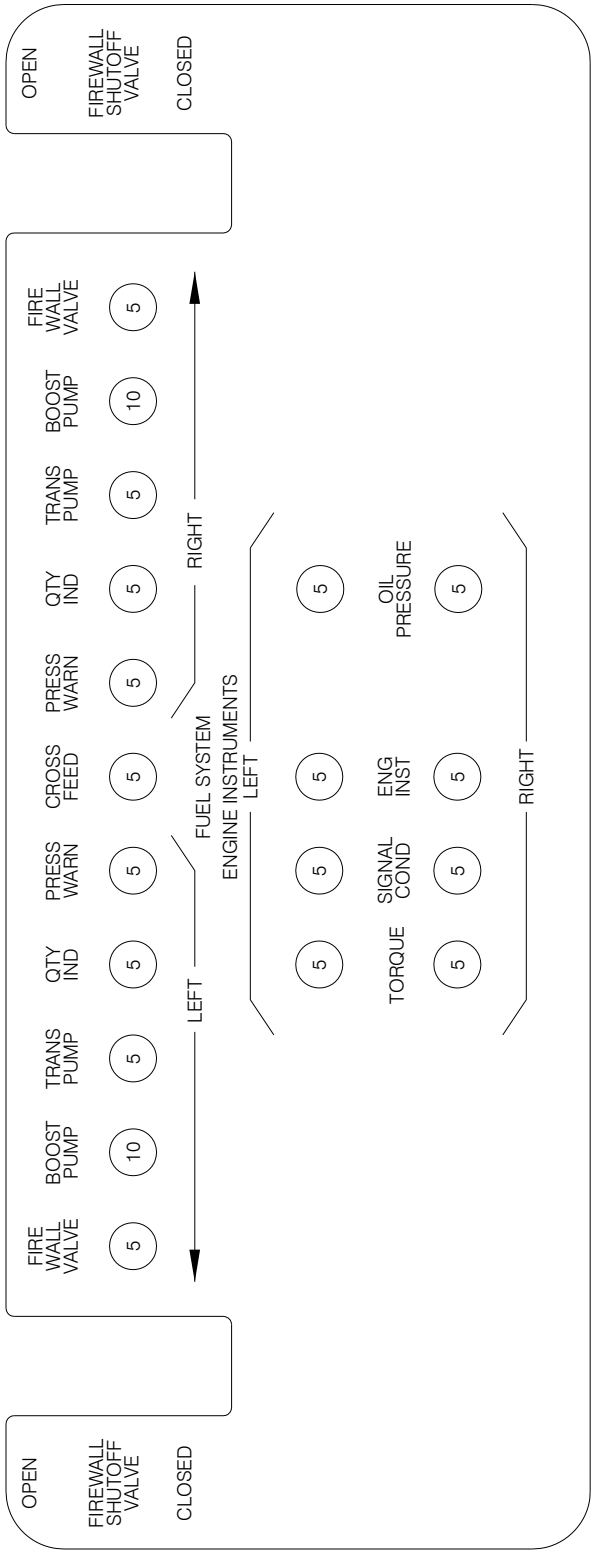


Figure 6, Left Side Circuit Breaker Panel (SN LJ-1361, LJ-1363 thru LJ-1846 and LJ-1848 thru LJ-1852)


OPEN
FIREWALL SHUTOFF VALVE
CLOSED
FIRE WALL VALVE
BOOST PUMP
TRANS PUMP
QTY IND
PRESS WARN
CROSS FEED
PRESS WARN
QTY IND
TRANS PUMP
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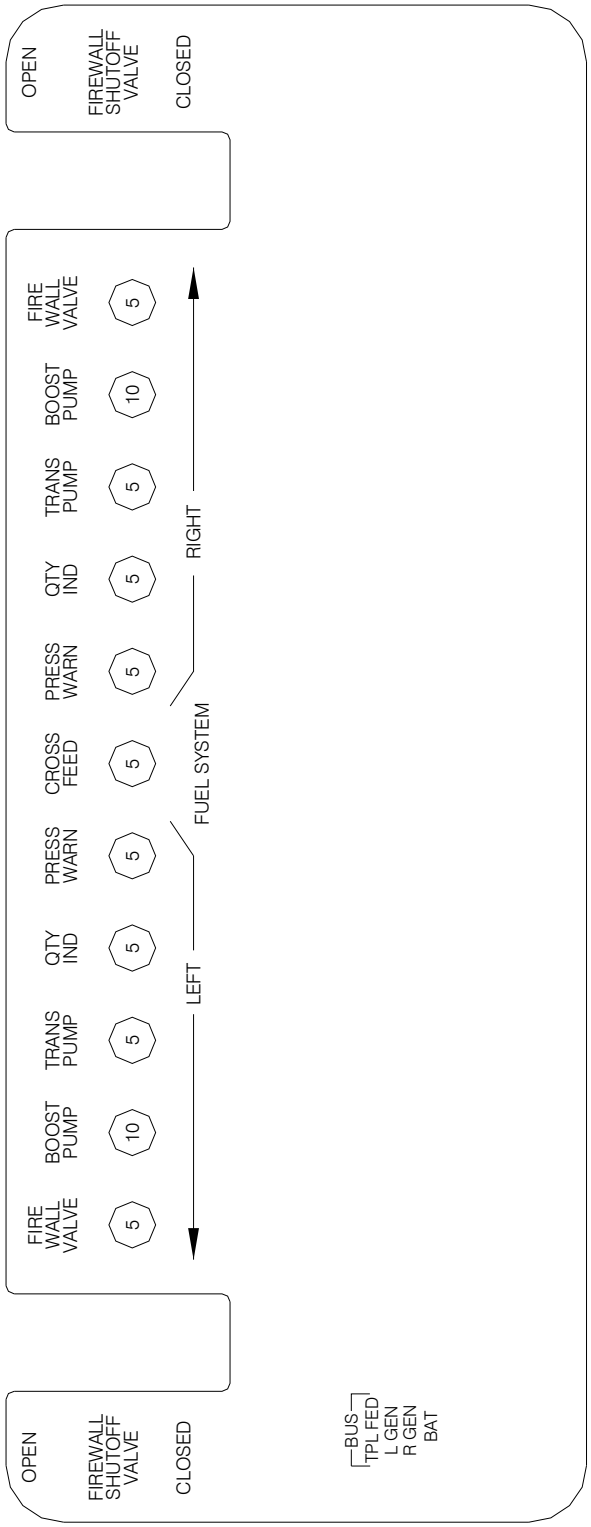


Figure 8, Left Side Circuit Breaker Panel (SN LJ-1847, LJ-1853 & After)

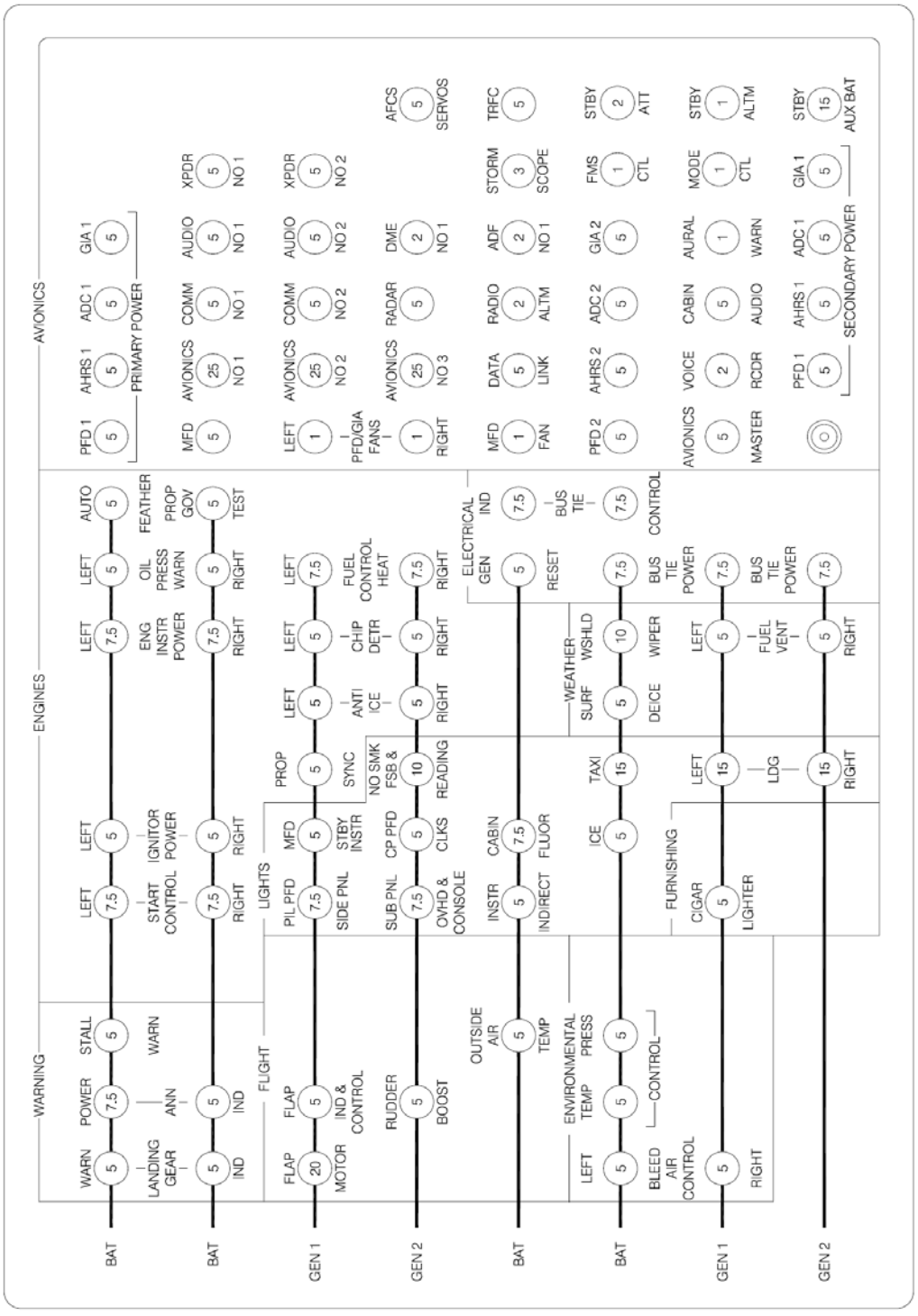


Figure 9, Right Side Circuit Breaker Panel (SN LJ-1361, LJ-1363 thru LJ-1846 and LJ-1848 thru LJ-1852)

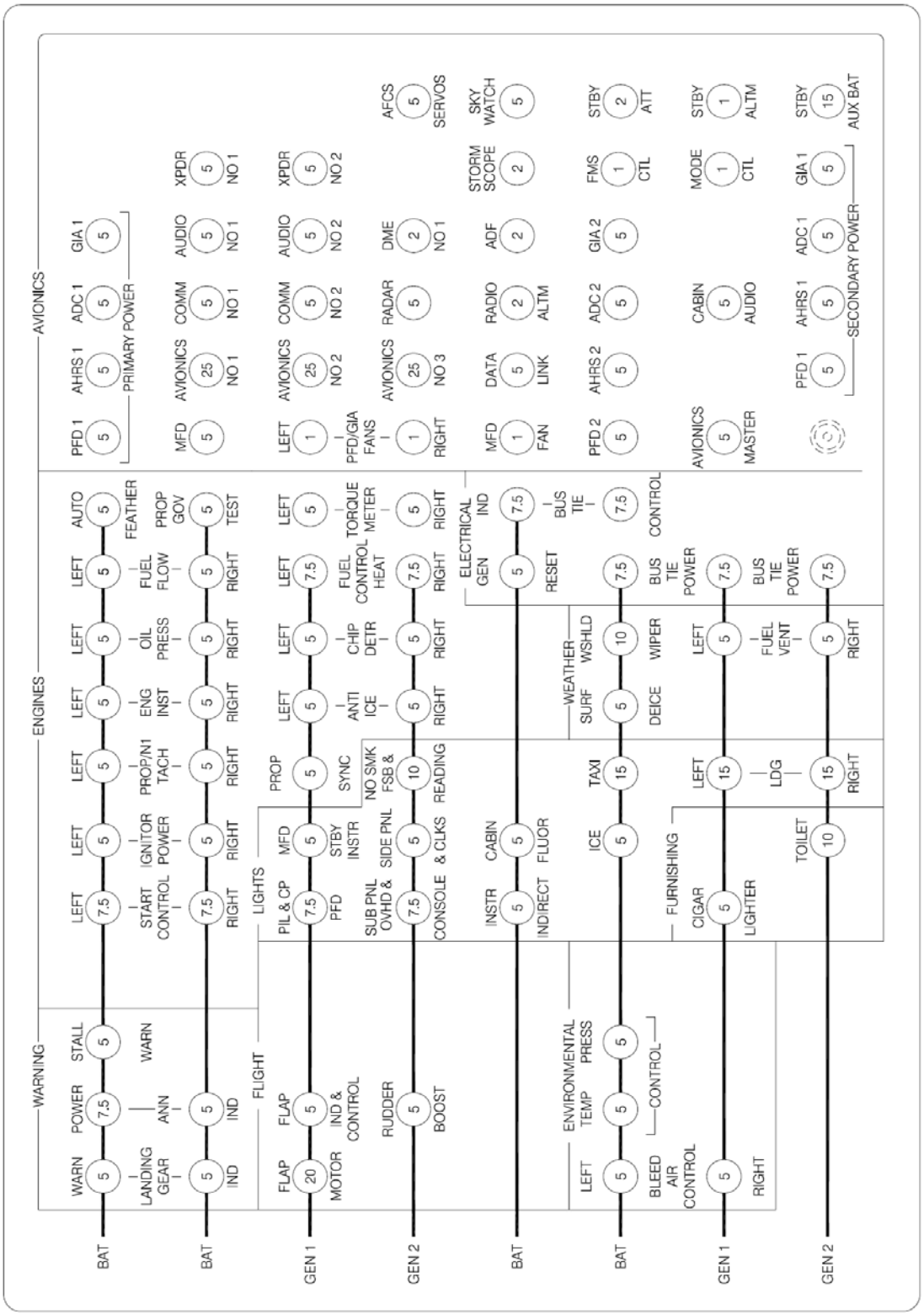


Figure 10, Right Side Circuit Breaker Panel (SN LJ-1063 thru LJ-1360, & LJ-1362)

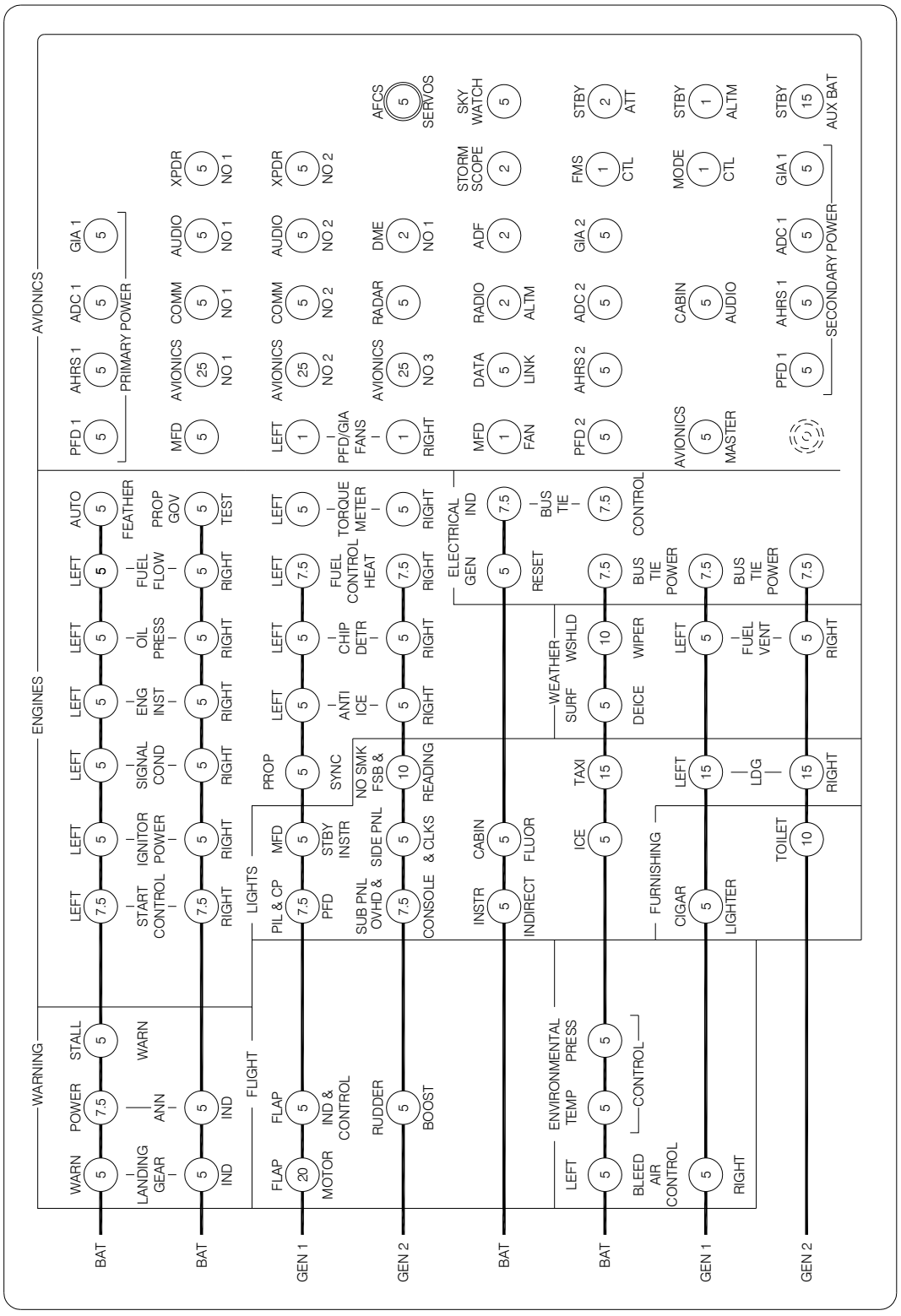


Figure 11, Right Side Circuit Breaker Panel (Alternate Configuration SN LJ-1063 thru LJ-1360, & LJ-1362)

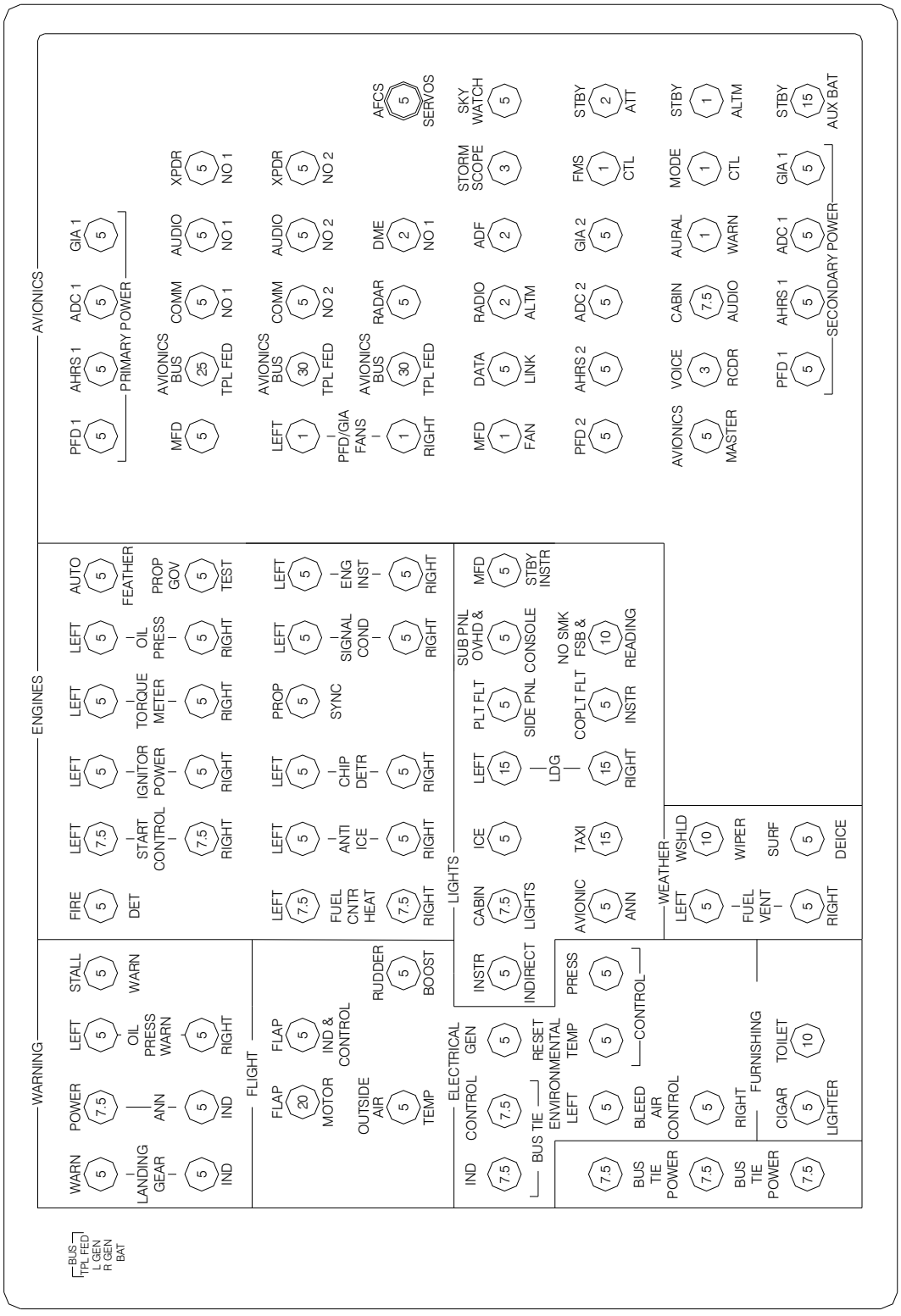


Figure 12, Right Side Circuit Breaker Panel (SN LJ-1847, LJ-1853 & After)

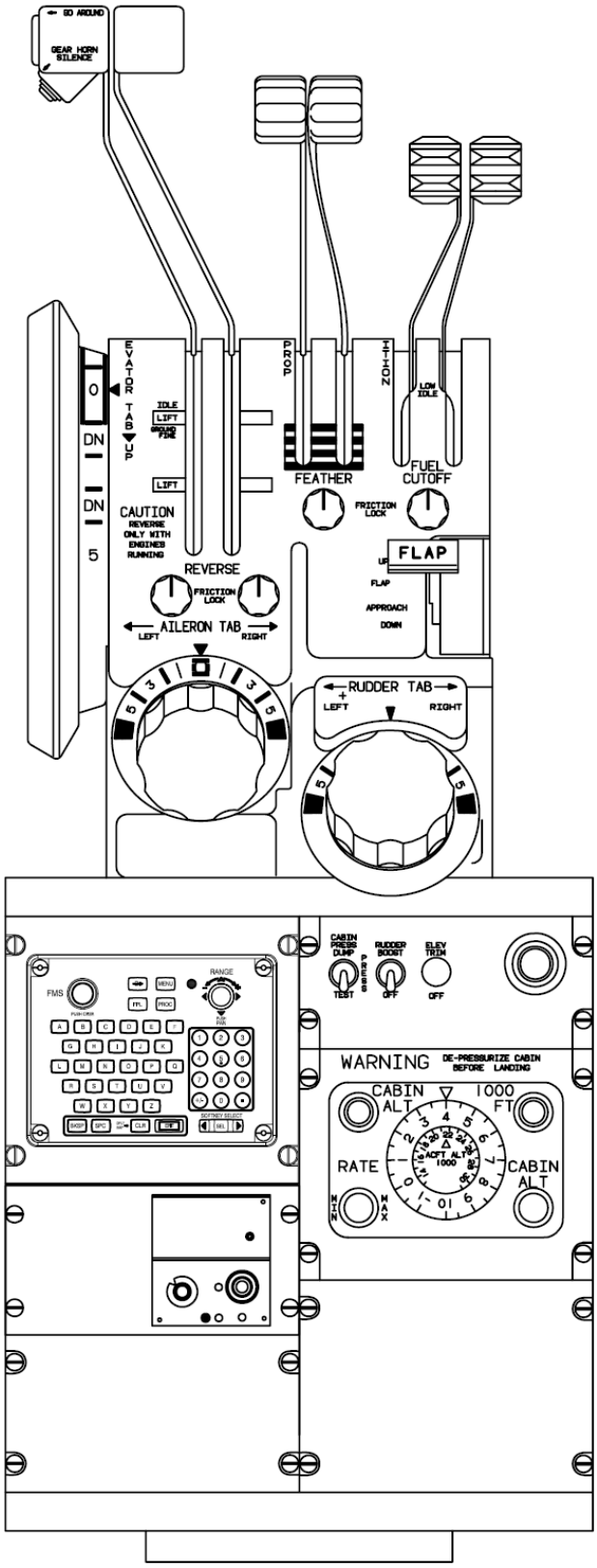


Figure 13, Pedestal

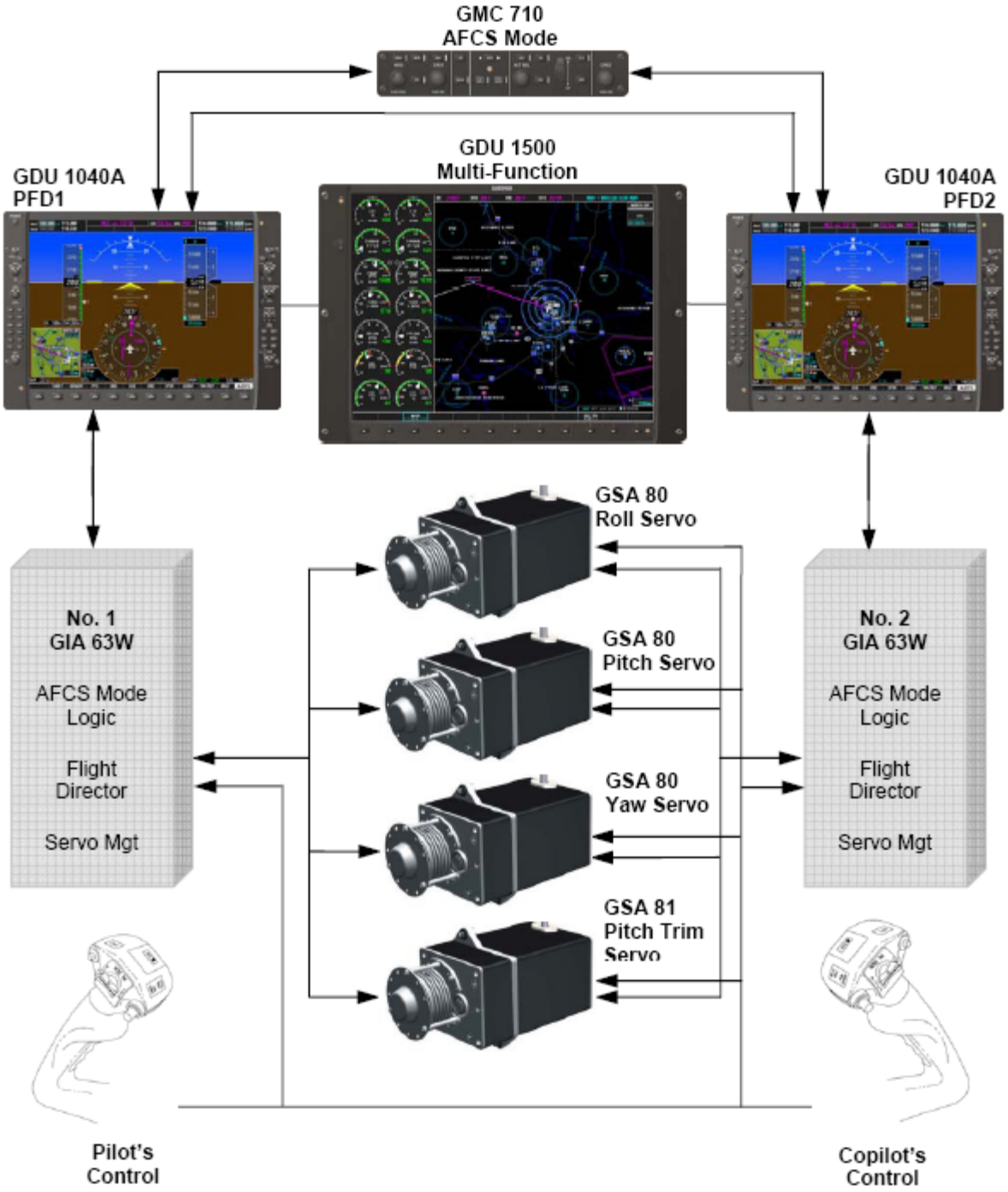


Figure 14, GFC 700 System Interface

FLIGHT CONTROLS

AFCS, AUTOPILOT AND FLIGHT DIRECTOR

The GFC 700 is a digital Automatic Flight Control System (AFCS), fully integrated within the G1000 System avionics architecture. The GFC 700 is a three axis autopilot and flight director system which provides the pilot with the following features:

Autopilot (AP) — Autopilot operation occurs within the pitch, roll, and pitch trim servos. It also provides servo monitoring and automatic flight control in response to flight director steering commands, AHRS attitude and rate information, and airspeed.

Flight Director (FD) - Two flight directors, each operating independently within their respective GIA and referred to as pilot-side and copilot-side. Commands for the selected flight director are displayed on both PFDs.

The flight director provides:

- Command Bars showing pitch/roll guidance
- Vertical/lateral mode selection and processing
- Autopilot communication

Yaw Damper (YD) — The yaw servo is self-monitoring and provides Dutch roll damping and turn coordination in response to yaw rate, roll angle, vertical acceleration, and airspeed.

Electric Pitch Trim — The pitch trim servo provides manual electric pitch trim capability when the autopilot is not engaged.

Pilot commands to the AFCS are entered through the GMC 710 Autopilot Mode Controller mounted in the center of the cockpit under the airplane's glareshield. The GMC 710 controller also controls the heading bug, navigation course selector on each PFD, and the altitude preselect.

Other components of the autopilot include four servos that also contain autopilot processor, control wheel-mounted elevator trim switches (copilot's side optional), control wheel-mounted autopilot/yaw damper disconnect and trim interrupt switch (A/P Y/D DISC/TRIM INTRPT), control wheel-mounted CWS (Control Wheel Steering) switch, and a go-around switch mounted in the left power lever knob.

The following conditions will cause the autopilot to disconnect:

- Electrical power failure, including pulling the AFCS circuit breaker
- Electrical power failure to the GMC 710 Autopilot Mode Controller, including pulling the MODE CTL circuit breaker
- Internal autopilot system failure
- Malfunction of either AHRS (two fully functional AHRS are required for the autopilot to function)
- Failure of the on-side PFD
- Depressing the red A/P Y/D DISC/TRIM INTRPT button on the pilot's or copilot's (if installed) control wheel
- Actuating the left section of the manual electric trim split switch, pilot's and copilot's control wheel
- Pushing the AP button on the autopilot mode controller when the autopilot is engaged
- Pushing the GO AROUND button on the left power lever (Non-ESP Equipped Airplanes)
- Turning OFF the Avionics Master Power Switch

CAUTION

Turning OFF the Avionics Master Power Switch will cause the autopilot to abnormally disconnect and the yaw damper to disconnect. An abnormal autopilot disconnect is normally annunciated visually by a red flashing 'AP' in the PFD FD mode window and a continuous high-low tone. However, when the Avionics Master Power Switch is turned OFF, electrical power is removed from the audio panels preventing the autopilot disconnect tone from being heard.

NOTE

Pressing and holding the CWS (control wheel steering) switch on the left grip of the pilot's control wheel will disconnect the autopilot servos from the airplane flight controls as long as the CWS switch is depressed. Upon release of the CWS switch, the system will synchronize to the existing pitch and roll modes selected. Review the GFC700 Cockpit Reference Guide for more information.

The following tables list the available AFCS vertical and lateral modes with their corresponding controls and annunciations. The mode reference is displayed next to the active mode annunciation for Altitude Hold, Vertical Speed, and Flight Level Change modes. The NOSE UP/DN Wheel can be used to change the vertical mode reference while operating under Pitch Hold, Vertical Speed, or Flight Level Change Mode. Increments of change and acceptable ranges of values for each of these references using the NOSE UP/DN Wheel are also listed in the table.

AFCS VERTICAL MODES

Vertical Mode	Control	Annunciation	Reference Range	Reference Change Increment
Pitch Hold	(default)	PIT	20° Nose up 15° Nose Down	0.5°
Level	***	LVL	0 fpm	
Selected Altitude Capture	*	ALTS		
Altitude Hold	**ALT** Key	ALT nnnnn FT		
Vertical Speed	**VS** Key	VS nnnn FPM	-4000 to +4000 fpm	100 fpm
Flight Level Change, IAS Hold	**FLC** Key	FLC nnn KT	100 to 226 kt	1 kt
Flight Level Change, Mach Hold		FLC M 0.nn	M 0.25 to 0.46	M0.01
Vertical Path Tracking (VNAV)	**VNV** Key	VPTH		
VNV Target Altitude Capture	**	ALTV		
Glidepath	**APR** Key	GP		
Glideslope		GS		
Takeoff (on ground)	**GA** Switch	TO		
Go Around (in air)		GA		

* ALTS arms automatically when PIT, VS, FLC, TO, or GA is active, and under VPTH when the Selected Altitude is to be captured instead of the VNV Target Altitude.

** ALTV arms automatically under VPTH when the VNV Target Altitude is to be captured instead of the Selected Altitude.

*** ESP equipped aircraft only. LVL mode is entered from an automatic engagement of the autopilot due to the aircraft remaining outside of the normal flight envelope for approximately 10 seconds.

AFCS LATERAL MODES

Lateral Mode	Control	Annunciation	Maximum Roll Command Limit
Roll Mode	(default)	ROL	25 ° Left Bank 25° Right Bank
Level	**	LVL	0° Roll
Low Bank	**BANK** Key	*	15° Left Bank 15° Right Bank
Heading Select	**HDG** Key	HDG	25° Left Bank 25° Right Bank
Navigation, GPS Arm/Capture/Track	**NAV** Key	GPS	30° Left Bank 30° Right Bank
Navigation, VOR Enroute Arm/Capture/Track		VOR	25° Left Bank 25° Right Bank
Navigation, LOC Arm/Capture/Track (No Glideslope)		LOC	25° Left Bank 25° Right Bank
Backcourse Arm/Capture/Track	**BC** Key	BC	25° Left Bank 25° Right Bank
Approach, GPS Arm/Capture/Track (Glidepath Mode Automatically Armed, if available)	**APR** Key	GPS	30° Left Bank 30° Right Bank
Approach, VOR Arm/Capture/Track		VAPP	25° Left Bank 25° Right Bank
Approach, ILS Arm/Capture/Track (Glideslope Mode Automatically Armed)		LOC	25° Left Bank 25° Right Bank
Takeoff (on ground)	**GA** Switch	TO	Wings Level
Go Around (in air)		GA	Wings Level

* No annunciation appears in the AFCS Status Box. The commandable bank angle range is indicated by a green band along the Roll Scale of the Attitude Indicator.

** ESP equipped aircraft only. LVL mode is entered from an automatic engagement of the autopilot due to the aircraft remaining outside of the normal flight envelope for approximately 10 seconds.

The CWS Button does not change lateral references for Heading Select, Navigation, Backcourse, or Approach modes. The autopilot guides the aircraft back to the Selected Heading/Course upon release of the CWS Button.

The autopilot may be engaged within the following ranges:

Pitch 50° nose up to 50° nose down

Roll ±75°

If the above pitch or roll limits are exceeded while the autopilot is engaged, the autopilot will disconnect. Engaging the autopilot outside of its command limits, but within its engagement limits, will cause the autopilot to return the aircraft within command limits. The autopilot is capable of commanding the aircraft in the following ranges:

Pitch 20° nose up to 15° nose down

Roll ±25°, or ±30° while using a GPS lateral mode

The Flight Director is not designed to perform unusual attitude recoveries from attitudes outside the following range:

Pitch 50° nose up to 50° nose down

Roll ±75°

If the above pitch or roll limits are exceeded with the flight director displayed on either PFD or the MFD, the flight director will be removed (decluttered) from the display until the aircraft is within display limits.

ELECTRIC ELEVATOR TRIM

The electric elevator trim is standard with the G1000 system installation. The electric elevator trim can be operated manually by the pilot using the pitch trim switches on the control wheel, or, automatically by the autopilot. Electric Elevator trim switches are optional on the copilot's control wheel. If pitch trim switches are installed on the copilot's control wheel, the pilot's pitch trim inputs override those made by the copilot

The ON/OFF toggle switch on the pedestal has been removed. Electric elevator trim will function if the AFCS circuit breaker (right side circuit breaker panel) is set and the autopilot has satisfactorily completed a preflight test.

Pitch trim rocker switches on the pilot's control wheel manually control the electric elevator trim system. NOSE DN at the top of the rocker switch, when depressed causes the elevator pitch trim servo to move the trim tab in the upward direction resulting in the nose of the airplane pitching downward. The control column will move in the forward direction and the pitch trim wheel will move forward in the nose down direction. Depressing NOSE UP at the bottom of the rocker switch results in the opposite of the previous motions with the airplane nose pitching up.

Runaway or malfunctioning trim can be interrupted by pressing and holding the red A/P Y/D DISC TRIM INTRPT switch on either control wheel. Pulling the AFCS circuit breaker on the right side circuit breaker panel will disable the electric elevator trim so it will not move when the TRIM INTRPT switch is released.

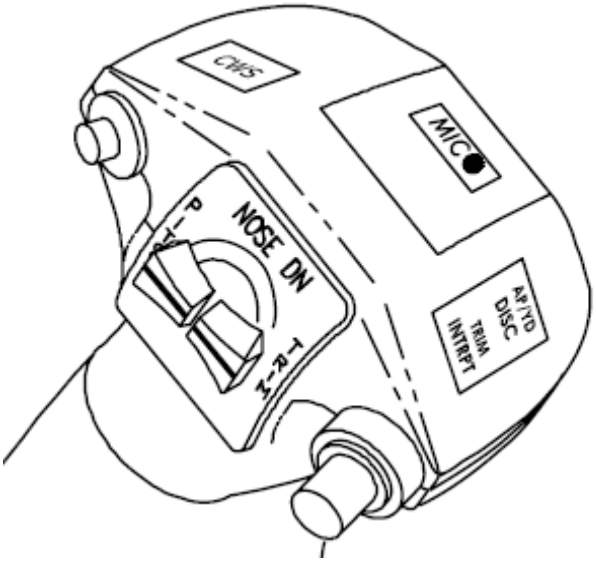


Figure 15, Electric Trim Switches, Pilot's Control Wheel

ELECTRONIC STABILITY & PROTECTION (ESP)

Electronic Stability and Protection (ESP) is an optional function on a GFC-700-equipped airplane that uses the autopilot servos to assist the pilot in maintaining the airplane in a safe flight condition within the aircraft's normal pitch, roll and airspeed envelopes.

Electronic Stability and Protection is invoked when the pilot allows the airplane to exceed one or more conditions beyond normal flight defined below:

- Pitch attitude beyond normal flight (+17°, -15°)
- Roll attitude beyond normal flight (45°)
- High airspeed beyond normal flight (Above 229 KIAS or .47M)

The conditions that are required for ESP to be available are:

- Pitch and Roll servos available
- Autopilot not engaged
- The Global Positioning System (GPS) altitude above ground (based on TAWS terrain data base) is more than 200 feet
- Aircraft is within the autopilot engagement envelope (+/-50° in pitch and +/-75° in roll)

Protection for excessive pitch, roll, and high airspeed is provided when the limit thresholds are first exceeded, which engages the appropriate servo in ESP mode at a nominal torque level to bring the airplane back within the normal flight envelope. If the airplane deviates further from the normal flight envelope, the servo torque will increase until the maximum torque level is reached in an attempt to return the aircraft into the normal flight envelope. Once the aircraft returns to within the normal flight envelope, ESP will deactivate the autopilot servos.

When the normal flight envelope thresholds have been exceeded for more than 10 seconds, ESP Autolevel Mode is activated. Autolevel Mode engages the AFCS to bring the airplane back into straight and level flight based on 0° roll angle and 0 fpm vertical speed. An aural "ENGAGING AUTOPILOT" alert sounds and the Flight Director mode annunciation will indicate LVL for the pitch and roll modes.

Anytime an ESP mode is active, the pilot can interrupt ESP by using either the Control Wheel Steering (CWS) or Autopilot Disconnect (AP DISC) switch. ESP may also be overridden by simply overpowering the flight controls. The pilot may also disable ESP by accessing the Multi-Function Display (MFD) AUX – SYSTEM SETUP 2 page on the MFD and manually disabling ESP. Once the flight has ended and power is removed from the G1000 system, ESP will default to "Enabled" on the next power-up.

GDU displayed in the examples are to provide position reference for the ESP system symbology. The values indicated are not representative of a condition required to activate ESP.

- When the GDU receives information from the GIA indicating that ESP is not armed, the GDU will not display ESP indications.

- When the GDU receives information from the GIA indicating that ESP is armed, the GDU will display the ESP roll limit indices.

The engagement and disengagement attitude limits are displayed with double hash marks on the roll indicator depending on the aircraft attitude and whether or not ESP is active in roll. When ESP is inactive (roll attitude within nominal limits) only the engagement limit indications are

displayed in order to reduce clutter on the roll indicator. See Figure 16 for an example of the ESP engagement limit indications.

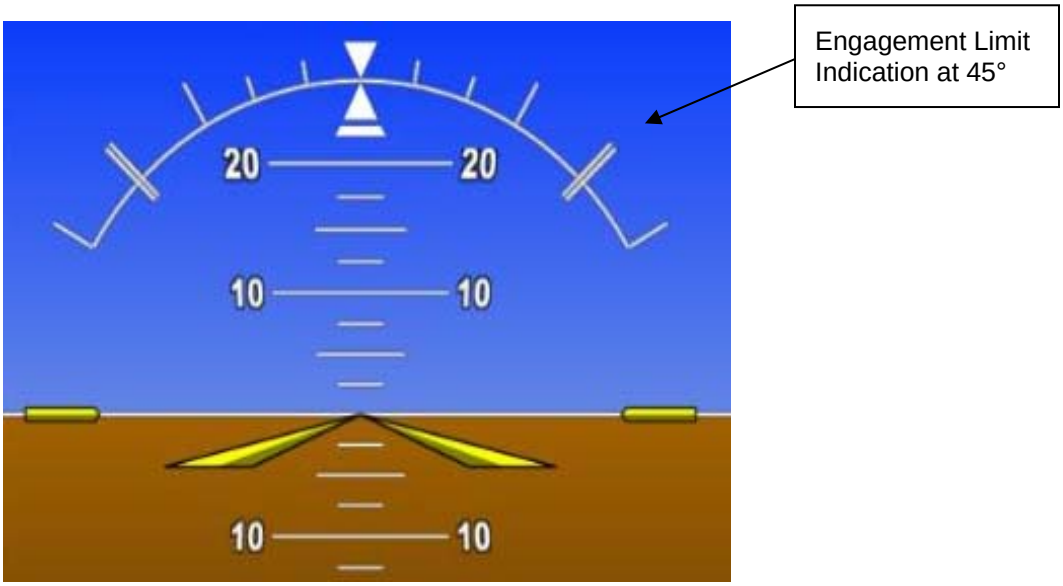


Figure 16 – Nominal Roll Attitude ESP Engagement Limit Indications

Once ESP becomes active in roll, the engagement limit indication that was crossed (either left or right) will move to the lower disengagement limit indication over a period of 1 second. The opposite roll limit remains at the engagement limit. Figure 17 shows the engagement limit indication just prior to ESP activation (left image) and just after ESP activation (right image 1 second after ESP activation).

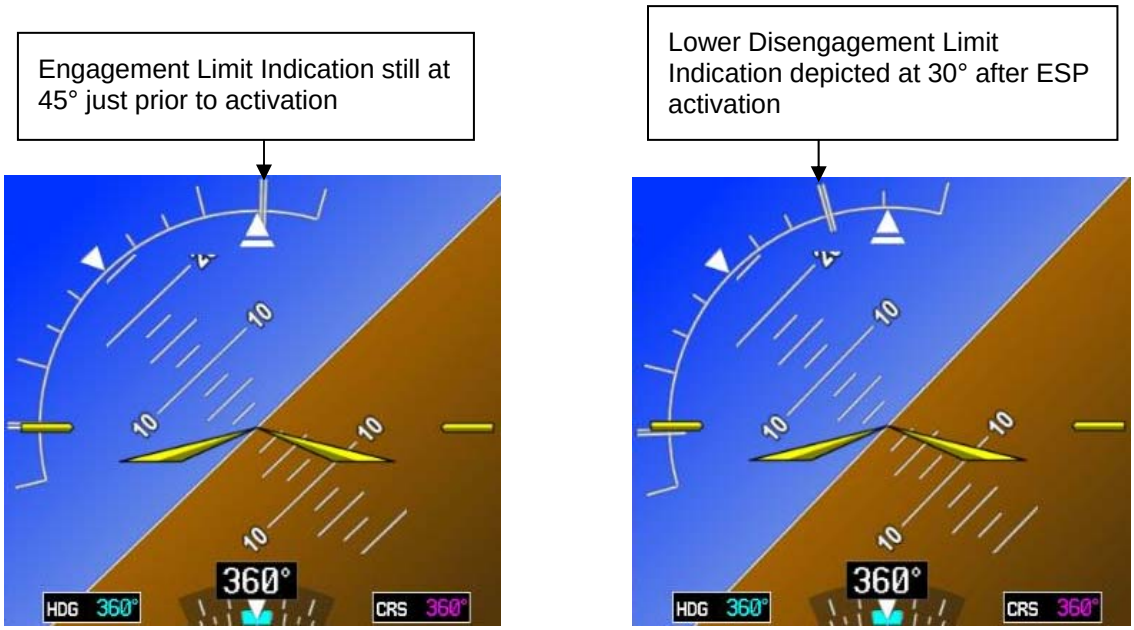


Figure 17 – Engagement Limit Indications Upon ESP Activation

If an attitude becomes extreme enough for the upper disengagement limit indication to be shown it will be drawn in a similar fashion to the engagement limit indication. See Figure 18 for an example of the ESP roll indication when ESP is active with an extreme positive roll attitude. In this case, the left roll limit is the engagement limit and the two right roll ESP limits are the lower and upper disengagement limit indications.

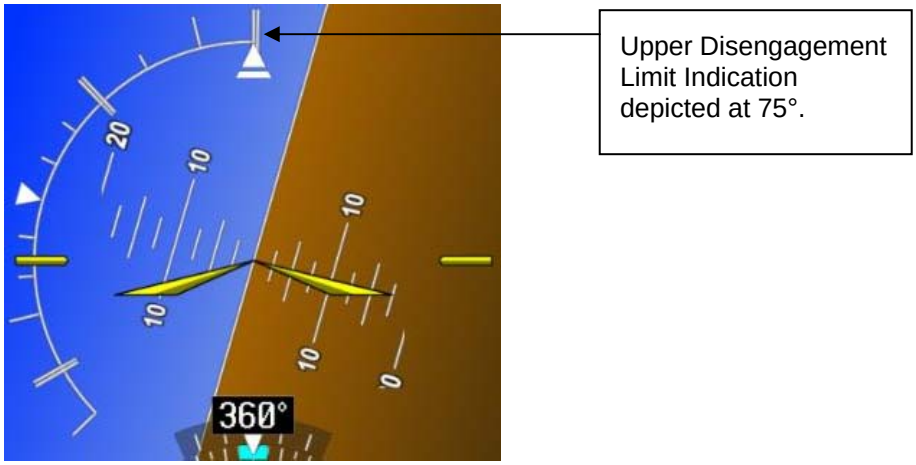


Figure 18 – Minimum and Maximum Roll Attitude ESP Disengagement Limit Indications

The ESP roll limit indications are not de-cluttered when the aircraft is in an extreme attitude. ESP roll limit indications are not shown when ESP is not configured for a given installation, ESP is not available as determined by the active GIA, or the autopilot is engaged.

Autopilot Underspeed Protection

For aircraft that have ESP installed, the AFCS is able to detect and protect against underspeed situations while the autopilot is engaged.

When the AFCS is engaged in a non-altitude critical mode (LVL, PIT, FLC, VS, VNV) and airspeed falls below the minimum threshold of 90 KIAS, the AFCS automatically enters minimum airspeed mode. A MINSPD annunciation appears above the airspeed tape, and the AFCS causes the airplane to pitch down to maintain 90 KIAS. An aural “AIRSPEED” alert will sound once when entering non-altitude critical Underspeed Protection.

If the AFCS is engaged in an altitude critical mode (ALT, GS, GP and GA) and the aural stall warning is played for more than 1 second, the AFCS will maintain a wings-level roll attitude and pitch the aircraft down at ~1kt/sec to maintain an airspeed that will cause the aural stall warning to stop playing, plus 2 KIAS. Also, an aural “AIRSPEED” alert will sound every 5 seconds.

All Underspeed Protection modes are exited automatically when there is enough aircraft performance to follow the originally selected flight director mode and reference.

Coupled Go-Around

ESP equipped aircraft are capable of flying fully coupled go-around maneuvers. Pressing the GA button on the left power lever will not disengage the autopilot. Instead, the AP will attempt to capture and track the flight director command bars. If insufficient aircraft performance is available to follow the commands, the AFCS will enter altitude-critical Underspeed Protection mode if stall warning occurs. GA mode is the only ESP-associated mode that can be engaged below 200’ AGL GPS altitude.

FLIGHT INSTRUMENTS

G1000 FLIGHT INSTRUMENTS

The flight instruments are an integrated part of the G1000 system. For system descriptions, operating instructions, and abnormal failure indication refer to the Cockpit Reference Guide.

STANDBY FLIGHT INSTRUMENTS

There are three 2 ¼ inch standby instruments that are located directly to the right of the pilot's Primary Flight Display arranged vertically, standby attitude indicator, standby altimeter, and standby airspeed indicator.

A standby attitude indicator located at the top of the stack is normally powered by the triple fed buss. In the event of total loss of aircraft electrical power, there is a standby battery that will power the standby attitude indicator for at least 30 minutes.

A standby altimeter is the next instrument in the stack. It is a mechanical instrument that requires no electrical power to operate. Electrical power is used to power an internal vibrator, used to minimize indicator pointer sticking, and instrument internal lighting. The vibrator is normally powered from the triple fed buss. In the event of total loss of normal aircraft electrical power, the vibrator and internal lighting is powered by the standby battery. The standby altimeter uses the copilot's static system for its source of static air pressure.

The bottom instrument is a mechanical airspeed indicator. It is a mechanical instrument that requires no electrical power to operate. Electrical power is used for internal lighting. In the event of a total loss of aircraft electrical power, the standby battery will power the instrument's internal lighting. The standby airspeed indicator uses the copilot's static system for its source of static air pressure, and the copilot's pitot system for its source of impact air pressure.

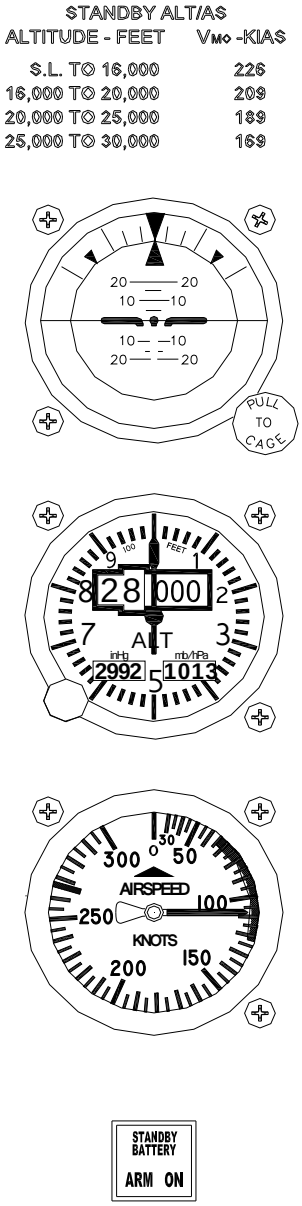


Figure 19, Standby Flight Instruments

ENGINE INSTRUMENTATION

Engine instruments, located in a window on the left side of the MFD, are grouped according to their function. The G1000 engine gauges are constructed and arranged to emulate the mechanical gauges they replaced. At the top, the ITT (Interstage Turbine Temperature) indicators and torquemeters are used to set take-off power. Climb and cruise power are established with the torquemeters and propeller tachometers while observing ITT limits. Gas generator (N_1) operation is monitored by the gas generator tachometers. The lower grouping consists of the fuel flow indicators and the oil pressure/temperature indicators.

The engine transducers send their signals to the Garmin GEA (Engine and Airframe LRU) where the analog signals are converted to digital signals where the engine parameters are displayed on the MFD. There are two GEAs, one for each engine. The GEAs operate on 28vdc power supplied by the triple fed bus and are protected by circuit breakers normally located on the left side circuit breaker panel labeled ENG INST. Some configurations will have the ENG INST circuit breakers located on the right side circuit breaker panel.

The ITT indicator gives a reading of engine gas temperature between the compressor turbine and the power turbines. A digital indication combined with the pointer gives a resolution of $1^{O}C$.

The torquemeters give an indication in foot-pounds of the torque being applied to the propeller. A digital indication combined with the pointer gives a resolution of 5 ft-lbs.

The propeller tachometer reads directly in revolutions per minute. A digital indication combined with the pointer gives a resolution of 10 rpm.

The N_1 or gas generator tachometer is in percent of rpm, based on a figure of 37,500 rpm at 100%. Maximum continuous gas generator speed is limited to 38,100 rpm or 101.5% N_1. A digital indication combined with the pointer gives a resolution of 0.1% rpm.

The fuel flow indicators give an indication of fuel consumption in pounds of fuel per hour. A digital indication combined with the pointer gives a resolution of 1 lb/hr.

The oil pressure indicator displays oil pressure (in PSI). A digital indication combined with the pointer gives oil pressure a resolution of 1 psi.

The oil temperature indicator displays oil temperature (in Degrees Celsius). A digital indication combined with the pointer gives oil temperature a resolution of $1^{O}C$

A propeller synchroscope located above and between the propeller tachometers, gives an indication of synchronization of the propellers. When the propellers are operating at the same rpm, the display will show stationary diamond symbols. As one propeller begins to turn faster than the other propeller, the diamonds will begin to move towards the faster turning propeller and transition into an arrowhead pointing towards the faster turning propeller. The transition to a full arrowhead is complete when the propeller speed difference is equal to 50 rpm. This instrument aids the pilot in obtaining synchronization of the propellers.

PROPELLER SYNCHROPHASER

A push button ON/OFF switch is located on the instrument panel below the pilot's PFD that turns the propeller synchrophaser ON and OFF. To turn the propeller synchrophaser ON, push the PROP SYNC switch. A green ON annunciator will illuminate when the system is on. To turn the propeller synchrophaser OFF, push the PROP SYNC switch.

Refer to the Systems Description section in the airplane's original Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for a description of the synchrophaser and its operation.

ELECTRICAL SYSTEM

INVERTERS

The two solid-state inverters are not needed with the G1000 system and have been removed.

POWER DISTRIBUTION

There are no changes to the electrical power generation, power feeders, control, or fault protection. Only the Avionics power distribution has changed.

AVIONICS/ELECTRICAL EQUIPMENT BUS CONNECTION

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
AVIONICS	**AVIONICS**	**AVIONICS**
PFD1/ GIA 1 Cooling Fan	Avionics Annunciator	PFD2 / GIA 2 Cooling Fan
No. 2 Avionics Bus	PFD 1 – Secondary Power	No. 3 Avionics Bus
COM 2	AHRS 1 - Secondary Power	Data Link
AUDIO 2	ADC 1 - Secondary Power	Radio Altimeter (OPT)
XPDR 2	GIA 1 - Secondary Power	ADF
RADAR		WX-500 Stormscope (OPT)
DME		Skywatch Traffic (OPT)
AFCS SERVOS		
ELECTRICAL	**ELECTRICAL**	**ELECTRICAL**
L Gen Bus (Bus Tie & Meter Indication)	Generator Reset	R Gen Bus (Bus Tie & Meter Indication)
L Generator Control Panel (1)		R Generator Control Panel (1)
L Generator Field & Sense (1)		R Generator Field & Sense (1)
L Generator Loadmeter (1)		R Generator Loadmeter (1)
ENGINE		**ENGINE**
L Engine Fuel Control Heater		R Engine Fuel Control Heater
L Chip Detector		R Chip Detector
L Main Anti-ice (Ice Vane)		R Main Anti-ice (Ice Vane)
R Standby Anti-Ice (Ice Vane)		L Standby Anti-Ice (Ice Vane)

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
ENVIRONMENTAL	**ENVIRONMENTAL**	
R Bleed Air Control	Air Conditioner Motor	
Vent Blower	Normal Heat (Electric)	
	Max Heat (Electric)	
FLIGHT CONTROL		**FLIGHT CONTROL**
Flap Indicator and Control		Rudder Boost
Flap Motor		
FUEL		**FUEL**
L Firewall Valve		R Firewall Valve
L Fuel Boost Pump		R Fuel Boost Pump
Crossfeed Valve		Crossfeed Valve
FURNISHINGS		**FURNISHINGS**
Cigarette Lighter		Refreshment Bar (Optional)
		Electric Toilet (Optional)
LIGHTS	**LIGHTS**	**LIGHTS**
Rotating Beacon Lights Tail	Taxi Light	Ovrhd, Subpanel &Pedestal Lights
L Landing Light	Icing Light	Recognition Lights (Optional, Center Bus or Right Gen Bus)
Tail Flood Lights (Optional)	Recognition Lights (Optional, Center Bus or Right Gen Bus)	Side Panel Lights
Standby Altimeter Internal Lighting		R Landing Light
Standby Attitude Indicator Internal Lighting		Strobe Lights (Optional)
Standby Airspeed Indicator Internal Lighting		Cabin Reading Lights & Sign Chime
	LANDING GEAR	
	Landing Gear Motor (1)	
PROPELLERS	**PROPELLERS**	
Prop Synchrophaser	Prop Deice	
		WARNING/ANNUNCIATORS
		NO SMOKING & FSB Signs
WEATHER	**WEATHER**	**WEATHER**
L Fuel Vent Heat	Pneumatic Surface Deice	R Fuel Vent Heat
Pilot Windshield Anti-ice(1)	Windshield Wiper	Copilot Windshield Anti-ice (1)
Prop Deice		R Pitot Heat
		Stall Warning Heat

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
		(1) The circuit breaker in this circuit is not accessible to the pilot in flight.

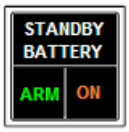
TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
AVIONICS		
PFD 1 – Primary Power		
AHRS 1 – Primary Power		
ADC 1 – Primary Power		
GIA 1 – Primary Power		
MFD – Power		
PFD 2 – Power		
AHRS 2 – Power		
ADC 2 – Power		
GIA 2 – Power		
MFD Controller		
Autopilot Mode Controller		
MFD Cooling Fan		
STBY Battery Charger		
Voice Recorder (OPT)		
Aural Warnings (OPT)		
Avionics Master Power		
Cabin Audio		
Avionics No. 1 Bus COM1 AUDIO 1 XPDR 1		
ELECTRICAL	**ELECTRICAL**	
Bus Tie Control	Battery Relay Power	
Bus Tie Indicator	Battery Voltmeter	
ENVIRONMENTAL		
Cabin Air Temperature Control		
Cabin Pressure Control		
L Bleed Air Control		

TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
ENGINE	**ENGINE**	
Autofeather (Optional)	L Engine Fire Extinguisher (Optional)	
Fire Detector (Optional)	R Engine Fire Extinguisher (Optional)	
L Igniter Power		
L Start Control		
L Torque		
L Signal Conditioner (VMI)		
L Engine Instrument (GEA)		
L Fuel Flow		
L Oil Pressure		
R Igniter Power		
R Starter Control		
R Torque		
R Signal Conditioner (VMI)		
R Engine Instrument (GEA)		
R Fuel Flow		
R Oil Pressure		
FLIGHT INSTRUMENTS		**FLIGHT INSTRUMENTS**
Standby Attitude Indicator Gyro		Standby Attitude Indicator Gyro
Standby Altimeter Vibrator		Standby Altimeter Vibrator
FUEL	**FUEL**	
L Fuel Qty Indicator	L Fuel Boost Pump	
L Fuel Transfer Pump	R Fuel Boost Pump	
L Firewall Valve	Fuel Crossfeed Valve	
L Boost Pump		
R Fuel Qty Indicator		
R Fuel Transfer Pump		
R Firewall Valve		
R Fuel Boost Pump		
Fuel Crossfeed Valve		
	FURNISHINGS	
	MOD (Stereo - Optional)	
LANDING GEAR		
Landing Gear Control		

TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
LIGHTS	**LIGHTS**	**LIGHTS**
	Entrance & Aft Dome Lights	Standby Altimeter Internal Lighting
		Standby Attitude Indicator Internal Lighting
		Standby Airspeed Indicator Internal Lighting
Cabin Flour Lights		
Instruments Indirect Lights		
Navigation Lights		
PROPELLERS		
Propeller Governor Test		
WARNING/ANNUNCIATORS		
Annunciator Indicator		
Annunciator Power		
L Oil Pressure Warning		
Landing Gear Position Indicator		
Landing Gear Warning Horn		
R Oil Pressure Warning		
Stall Warning		
L Fuel Pressure Warning		
R Fuel Pressure Warning		
L Auxiliary Fuel Quantity Warning		
R Auxiliary Fuel Quantity Warning		
WEATHER		
L Pitot Heat		

STANDBY BATTERY POWER SUPPLY

The G1000 installation incorporates a 24 vdc, 5 Ah JET model PS-835 Standby Battery that provides electrical power for the standby attitude gyro, standby altimeter vibrator, and internal lighting for the three standby instruments for a minimum of 30 minutes following a total loss of aircraft power including the aircraft's battery.



A push button switch located directly below the standby airspeed indicator controls the standby battery power system. The switch is a push ON (switch latches in), push OFF (switch pops out) type of switch.

The system has three modes: OFF, ON, and ARM.

OFF — The system is OFF when the Standby Battery switch is popped out. There are no internal switch annunciators illuminated in the switch when the system is OFF.

ON (Amber) — Illuminates when the standby battery is powering the standby instruments. The Standby Battery switch must be latched 'IN' and the airplane has no source of normal electrical power for the standby battery to power the standby instruments. When the ON annunciator is illuminated, the standby battery will provide electrical power for the three standby instruments for at least 30 minutes.

ARM (Green) — The system is ARMed for automatic operation when the Standby Battery switch is latched 'IN' and the airplane is being powered by a normal source of electrical power. Normal source of electrical power includes the airplane's battery, or, at least one generator, or external power.

During normal operations, the standby battery is kept in a fully charged state by its own trickle charger powered from the triple-fed bus through the STBY AUX BAT circuit breaker located on the right side circuit breaker panel.

LIGHTING SYSTEMS

COCKPIT

An overhead light control panel, accessible to both pilots, incorporates a functional arrangement of all lighting systems. Each light group has its own rheostat switch placarded BRT – OFF. The MASTER PANEL LIGHTS – ON – OFF switch is the master switch for: PILOT PFD, STBY INSTR, MFD, OVHD PED & SUBPANEL SIDE PANEL CLOCKS, and COPILOT PFD.

PILOT PFD – Controls the brightness of the pilot's PFD.

STBY INSTR – Controls the brightness of the internal lighting for the standby attitude indicator, standby altimeter, and standby airspeed indicator.

MFD – Controls the brightness of the Multi-Function Display (MFD).

OVHD PED & SUBPANEL - Controls the brightness of the backlighting of the overhead light control panel and internal lighting of the overhead electrical gauges, throttle quadrant backlighting, internal lighting for pedestal mounted gauges, and the MFD Controller panel backlighting, and the subpanel backlighting.

SIDE PANEL – Controls the brightness of the backlighting of the right side circuit breaker panel, the left side circuit breaker panel and the fuel gauge panel.

CLOCKS – Controls the brightness of the clocks mounted in the pilot's and copilot's control wheels.

COPILOT PFD – Controls the brightness of the copilot's PFD.

Separate rheostat switches individually control the instrument indirect lights in the glareshield and overhead map lights.

An INSTRUMENT EMERG LIGHTS switch is located on the right side of the overhead electrical gauge panel. This switch turns on indirect lights under the glareshield. These lights are separate from the Instrument Indirect lights. The brightness of the Emergency Lights is not controllable. These lights are powered from the Hot Battery bus.

PITOT AND STATIC SYSTEM

PITOT

The pitot heads are the sources of impact air for the operation of the flight instruments.

A heated pitot mast is located on each side of the lower portion of the nose. Tubing from the left pitot mast is connected to the pilot's Air Data Computer (ADC1), and tubing from the right pitot mast is connected to the copilot's Air Data Computer (ADC2) and the standby airspeed indicator. The switch for the PITOT – LEFT – RIGHT – OFF is located in the ICE PROTECTION group on the pilot's right subpanel.

STATIC

The normal static system has two separate sources of static air, one source is connected to the pilot's Air Data Computer (ADC1), and the other source is connected to the copilot's Air Data Computer (ADC2) and the standby instruments. Each of the normal static air lines opens to the atmosphere through two static air ports; one on each side of the aft fuselage; four ports total.

An alternate static air line is also provided for the pilot's Air Data Computer (ADC1). In the event of a failure of the pilot's normal static air source (e.g., if ice accumulations should obstruct the static air ports), the alternate source can be selected by lifting the spring-clip retainer off the PILOT'S EMERGENCY STATIC AIR SOURCE valve handle, located on the right side panel, and moving the handle aft to the ALTERNATE position. This will connect the alternate static air line to the pilot's Air Data Computer (ADC1). The alternate line is open to the unpressurized area just aft of the rear pressure bulkhead. When the alternate static air source is not needed, ensure that PILOT'S EMERGENCY STATIC AIR SOURCE valve handle is held in the forward (NORMAL) position by the spring-clip retainer.

WARNING

The pilot's airspeed and altimeter indications change when the alternate static air source is in use. Refer to the Airspeed Calibration – Alternate System, and the Altimeter Correction – Alternate System graphs in Section 5, PERFORMANCE, of the airplane's original Pilot's Operation Handbook and FAA Approved Airplane Flight Manual for operation when the alternate static air source is in use.

There are three drain petcocks for draining the static air lines located below the side panel on the right sidewall behind an access cover. These drain petcocks should be opened to release any trapped moisture at each inspection interval or after exposure to visible moisture on the ground, and must be closed after draining.

GROUND COMMUNICATIONS

Ground communications is provided by the G1000 system by turning ON the airplane's battery and the Avionics Master switch. Com1 and the pilot's audio panel will be powered. The pilot may use the airplane's speaker and hand microphone or a headset for communication.

SYNTHETIC VISION

General

The SVS sub system is dependent upon terrain data provided by the underlying G1000 system. If, for some reason, the terrain data is not available from the G1000, all of the components of the SVS system will be unavailable. The flight path marker, horizon heading, and airport signs are all sub-components of the Synthetic Terrain display and are only available when Synthetic Terrain is enabled. Those features are selected or de-selected using the PFD softkeys on the SVS menu.

Synthetic Terrain

The synthetic (3D) terrain display on the PFD provides a perspective view of the terrain ahead of the aircraft showing ground features up to 30 degrees left and 35 degrees right of the airplane heading. The terrain display is derived from the same terrain data contained in the G1000 system that is optionally used to display terrain on the MFD map display. The terrain data has a resolution of 9 arc-seconds, this means that the terrain elevation contours in the database are stored broken down into squares 9 arc-seconds on each side. That data is processed and smoothed by the G1000 system to provide the synthetic terrain display. In some instances, terrain features such as lakes in mountainous areas may be presented by the SVS system as if the lake water extends somewhat up the mountainside. This is due to the limitations of the terrain database resolution but is not significant for the approved uses of the SVS system.

The SVS terrain display will show land contours; large water features; and, towers and other obstacles over 200 ft AGL (including buildings), that are included in the G1000 obstacle database. In order to provide a clean, uncluttered PFD display, cultural features on the ground such as; roads and highways, railroad tracks, cities, and political boundaries (state / county lines) are not displayed on the PFD even if those features are selected for display on the MFD. The colors used to display the terrain elevation contours are similar to those used on the MFD map. The terrain display also includes a north-south, east-west grid to assist in orientation relative to the terrain.

The terrain display is intended to serve as an awareness tool only. It may not provide either the accuracy or fidelity, or both, on which to solely base decisions and plan maneuvers to avoid terrain or obstacles. Navigation must not be predicated solely upon the use of the TAWS, Terrain or Obstacle data displayed by the G1000 SVS system.

For airplanes that have system software 0636.02 or earlier installed, the terrain/obstacle/airport databases have an area of coverage as detailed below:

- The terrain database has an area of coverage from North 75° Latitude to South 60° Latitude in all longitudes.
- The airport terrain database has an area of coverage that includes the United States, Canada, Mexico, Latin America, and South America.
- The obstacle database has an area of coverage that includes the United States.

For airplanes that have system software 0636.03 or later installed, the terrain and obstacle databases have an area of coverage as detailed below:

- The terrain database has an area of coverage from North 90° Latitude to South 90° Latitude in all longitudes.
- The obstacle database has an area of coverage that includes the United States and Europe.

NOTE

The area of coverage may be modified, as additional terrain data sources become available.

Obstacle and Terrain Alerts and Warnings

Obstacles and terrain displayed on the SVS system may be highlighted if an alert or warning is generated by the G1000 Terrain or TAWS system. If an obstacle alert is presented for an obstacle that is in the SVS field of view, the obstacle symbol on the PFD will turn yellow in color. If an obstacle warning is generated by the G1000 system, the obstacle symbol on the PFD will turn red.

If the G1000 Terrain or TAWS system generates a terrain alert or warning, the terrain feature displayed on the PFD will be colored yellow for an alert or red for a warning for as long as the alert remains valid.

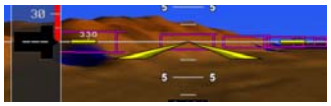
Because the area monitored by the Terrain or TAWS system can be wider than the field of view that can be displayed by the SVS system, it is possible to receive an obstacle or terrain audible alert for an obstacle or terrain that is not shown on the SVS display. In those cases, the object generating the alert will be left or right of the aircraft. Refer to the other displays in the aircraft to determine the cause of the message.

Flight Path Marker

The SVS display includes a green circular barbed symbol called the Flight Path Marker (FPM) that represents the current path of the airplane relative to the terrain display. The FPM is always displayed when synthetic terrain is displayed and the aircraft ground speed exceeds 30 kt. The FPM indicates the current lateral and vertical path of the airplane as determined by the GPS sensor. If the FPM is above the horizon line, the airplane is climbing, and similarly if the FPM is below the horizon line, the airplane is descending. If the airplane is flying in a crosswind, the FPM will be offset from the center of the display. In that case, the center of the PFD airplane reference symbol indicates the airplane heading and the FPM indicates the direction that the airplane is actually moving, taking into account the crosswind.

The FPM indicates the current path of the airplane but does not predict the future path. If aircraft attitude, power setting, airspeed, crosswind, etc. are changed, the FPM will move to indicate the new path resulting from those changes.

If the FPM is below the terrain or obstacle displayed behind it on the PFD, the current aircraft path will not clear that terrain or obstacle. If the FPM is above that terrain or obstacle, the aircraft will clear the terrain or obstacle IF, AND ONLY IF, THE CURRENT AIRCRAFT CONFIGURATION IS MAINTAINED, AND THE AIRCRAFT PERFORMANCE WILL PERMIT YOU TO MAINTAIN THE CURRENT VERTICAL (CLIMB) GRADIENT UNTIL PAST THE TERRAIN OR OBSTACLE.

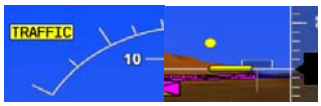


Pathway

If PATHWAY is enabled on the SVS menu of the PFD and a defined navigation path has been entered on the G1000, the SVS system will display a pathway, sometimes called a “highway in the sky” or HITS. The pathway is a perspective representation of the programmed flight path. When the aircraft is well off course, the pathway will be displayed as a number boxes floating in the sky along the programmed lateral and vertical path. As the aircraft intercepts the programmed flight path, the number of boxes displayed will be reduced to a maximum of four to avoid cluttering the PFD display. The pathway is only displayed for navigation paths that are fully defined by the sensor in use. Because a fully defined lateral and vertical path through space is not defined by them, a Pathway is not displayed for heading legs, VOR, LOC, BC or ADF segments. When the Pathway is displayed, the color of the boxes indicates the sensor generating the path. If the GPS sensor is in use, the boxes will be magenta colored. If the LOC sensor is defining the path in use, the boxes will be green.

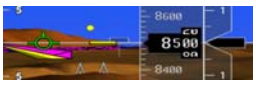
The Pathway boxes are +- 100 ft in vertical dimension and approximately +-380 ft horizontally from the center of the box. The Pathway presentation is intended only to aid the pilot in awareness of the programmed flight path location relative to the airplane’s current position. The pathway is not intended for use as a primary reference in tracking the navigation path.

If a GPS based descent profile has been programmed either on the G1000 flight plan page or as part of an approach or STAR, the descent will be displayed by the Pathway. Climb paths are never displayed by the Pathway. If a profile requires a climb, the Pathway will be displayed as a level segment at the higher of the altitude defined by the programmed path or the G1000 altitude selector.



Traffic

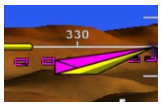
If traffic that is within the SVS field of view is detected by the G1000 system, a symbol will be displayed on the PFD indicating the direction and relative altitude of the traffic. The traffic will be displayed as a white diamond unless it generates a traffic alert. Traffic that causes an alert will be displayed as a solid yellow circle accompanied by a yellow TRAFFIC annunciator to the right of top of the airspeed display tape.



Horizon line

The SVS display includes an always visible white horizon line that represents the true horizon. Terrain will be presented behind the horizon line, and terrain shown above the horizon line is above the current

aircraft altitude. Terrain that is shown below the horizon line is below the aircraft altitude.



Horizon Heading

A heading scale may be displayed on the PFD horizon line, if selected by the pilot. The heading marks are spaced in even 30 degree increments and are presented just above the horizon line with tic marks that intersect the horizon line. The horizon heading will correspond to that presented by the HSI. Because the horizon heading is only displayed in 30 degree increments, it should only be used for general heading awareness and not be used to establish the aircraft heading.

Airport Signs and runway highlight

If APTSIGNS is selected, a “sign post” along with a representation of the runways will be plotted on the SVS display for nearby airports that are contained in the G1000 airport database. The signpost will become visible when you are within approximately 15nm of the airport. The text identifier for the airport will be displayed inside the airport sign when the aircraft reaches approximately 8 nm from the airport. Once the aircraft reaches approximately 4.5 nm from the airport, the airport sign will be removed but the runways presentation will remain. If an approach to a specific runway has been loaded and activated, that runway will be highlighted on the SVS display.

When on an approach, the highlight for the approach runway will be considerably larger than “normal” to assist in visually acquiring the runway. The oversized highlight will automatically shrink around the runway depiction so that the runway is proportionally displayed when the aircraft is within approximately ½ nm of the threshold. Runway highlighting is displayed even if APTSIGNS are turned off.

Section 8 – Handling, Service, and Maintenance

Refer to Garmin G1000 Instructions For Continued Airworthiness, P/N 190-00682-01 Rev. A or later FAA approved revision for maintenance requirements for the G1000 system and components.